DOE/EM-0545

Annual Report

of Waste Generation and Pollution Prevention Progress 1999

U.S. Department of Energy
Office of Environmental Management
Office of Technical Program Integration (EM-22)

September 2000

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Additional information is available from:

EM Web Site Address: http://www.em.doe.gov

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The Pollution Prevention Team (EM-22) Web Site Address: http://www.em.doe.gov/wastemin (select "Pollution Prevention Team") or http://twilight.saic.com/wastemin/
Waste generation data and pollution prevention accomplishment data are searchable by reporting site and waste type.

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Preface

The Secretary of Energy
Washington, DC 20585

September 20, 2000

This eighth edition of the *Annual Report of Waste Generation and Pollution Prevention Progress* highlights waste reduction, pollution prevention accomplishments, and cost avoidance for the Department of Energy for Calendar Year 1999.

I am pleased to report two significant accomplishments within the Department that have cut waste and created a healthier environment for workers and the public as we carry out our many important missions. First, the Department exceeded the 1996 Secretarial pollution prevention goals to reduce waste from routine operations that ended in December 1999. From 1993 to 1999, the Department reduced its generation of radioactive and hazardous waste from such operations by 74 percent. Second, since 1996, sites have reported implementing over 2,000 pollution prevention and waste reduction projects, cutting waste generation by an impressive 600,000 cubic meters, and avoiding $600 million in costs for taxpayers. These accomplishments can be attributed to the dedication of the Federal and contractor staff who continually identify pollution prevention cost savings opportunities. I congratulate these site teams for their outstanding efforts to find and implement site pollution prevention projects.

Several initiatives have been instituted within the last year to strengthen our environmental commitments. On November 12, 1999, I established comprehensive new goals for pollution prevention and energy efficiency for the Department. We expect to achieve these goals by 2005 and 2010. Additionally, President Clinton recently issued several *Greening the Government* Executive Orders that focus on waste prevention, recycling, Federal acquisition of products with recycled content, energy efficiency, transportation, and integrated environmental management. As Secretary, I am committed to ensuring the Department of Energy continues its work to build a sustainable, environmentally-healthy economy for the next century through *Greening the Government* efforts.

Prevention is more than meeting our Executive Order requirements and Secretarial Goals; it enables us to protect the environment, public health, and save taxpayer dollars. I look forward to reporting more Pollution Prevention program successes.

Bill Richardson

At A Glance

This Annual Report summarizes and highlights waste generation, waste reduction, pollution prevention accomplishments, and cost avoidance for 44 U.S. Department of Energy reporting sites for Calendar Year 1999. This section summarizes Calendar Year 1999 Complex-wide waste generation and pollution prevention accomplishments.

In May 1996, the Secretary of Energy established a 50 percent Complex-Wide Waste Reduction Goal (relative to the 1993 baseline) for routine operations radioactive, mixed, and hazardous waste generation, to be achieved by December 31, 1999. This Report completes the Calendar Years 1993 through 1999 Secretarial Goal period, and documents DOE's performance in relation to these Goals. New pollution prevention and energy efficiency goals for Fiscal Years 2000 through 2010 were issued by Secretary of Energy Bill Richardson in November 1999, and these new goals are briefly introduced in this Report (Figure 1.1).

DOE has achieved its Complex-Wide Waste Reduction Goals for routine operations based upon a comparison of 1999 waste generation to the 1993 baseline. Excluding sanitary waste, routine operations waste generation decreased 74 percent overall from 1993 to 1999. DOE also achieved its recycling goal based upon a comparison of 1998 and 1999 recycling amounts. However, for the second consecutive year, the total amount of materials recycled by the Complex decreased. From 1998 to 1999, the total amount of materials recycled by the Complex decreased from 92,800 metric tons to 75,100 metric tons, and the recycling percentage decreased from 55 percent to 39 percent. Most of the sites across the Complex reported a decrease in recycling amounts from 1998 to 1999, with the largest decreases reported by the East Tennessee Technology Park, Hanford Site, Los Alamos National Laboratory, Oak Ridge Y-12 Plant, and the Pantex Plant.

Calendar Year 1999 DOE Complex-Wide Waste Generation

- In 1999, approximately 919,800 cubic meters of waste from routine operations and cleanup/stabilization activities (refer to Appendix E for definitions) were generated:
  - 775,800 cubic meters of radioactive waste (84 percent)
  - 4,000 cubic meters of mixed waste (less than one percent)
  - 23,200 metric tons of hazardous waste (three percent)
  - 116,800 metric tons of sanitary waste (13 percent)
- From 1998 to 1999, total waste generated by routine operations and cleanup/stabilization activities increased by 21 percent.
- From 1993 to 1999, total waste generated by routine operations and cleanup/stabilization activities increased 274 percent due to DOE's aggressive cleanup efforts.
- Excluding sanitary waste:
  - Routine operations waste generation decreased 20 percent, and cleanup/stabilization waste generation increased 20 percent from 1998 to 1999.

- Cleanup/stabilization waste generation (787,600 cubic meters) was approximately 51 times greater than routine operations waste generation (15,500 cubic meters).
- Transuranic, low-level radioactive, low-level mixed, and hazardous waste were generated primarily by cleanup/stabilization activities.
- Low-level radioactive waste was the largest waste type generated, accounting for approximately 96 percent of the total waste generated.

Calendar Year 1999 Waste Generation by Operations/Field Office

- The Oak Ridge Operations Office generated the largest amount of routine operations waste (18 percent).
- The Ohio Field Office generated the largest amount of cleanup/stabilization waste (53 percent).

Calendar Year 1999 Pollution Prevention Accomplishments

- Pollution prevention projects include projects conducted in 1999 and ongoing recycle/reuse projects, and exclude wastewater, ongoing source reduction and segregation projects, and programmatic activities:
  - A total of 553 pollution prevention projects were completed by 34 of the 44 reporting sites in 1999, compared to 650 projects completed by 33 of the 45 reporting sites in 1998.
  - Pollution prevention projects resulted in a Complex-wide waste reduction of approximately 209,600 cubic meters, with a reported cost savings/avoidance of approximately $201.2 million.
  - Pollution prevention projects reduced radioactive waste generation by approximately 142,500 cubic meters, low-level mixed by 1,900 cubic meters, hazardous by 4,100 metric tons, and sanitary by 61,100 metric tons.
  - The Richland, Oak Ridge, Ohio, and Albuquerque Operations/Field Offices reported the largest total waste reduction from pollution prevention projects.
  - The Chicago, Richland, Rocky Flats, and Idaho Operations/Field Offices reported the largest total cost savings/avoidance from pollution prevention projects.

Calendar Year 1999 Reported Cost Savings/Avoidance

- In 1999, pollution prevention projects resulted in a total reported cost savings/avoidance of $201.2 million. Sixty-five percent of this reported cost savings/avoidance resulted from three projects. If the reported cost savings/avoidance from these projects were deducted, the total reported cost savings/avoidance for 1999 would be approximately $70 million, which is a decrease of $89 million compared to 1998's total reported cost savings/avoidance of $159 million. These projects include a recycle/reuse project at the Princeton Plasma Physics Laboratory that saved/avoided $61.5 million by reusing systems and equipment in the construction of the National Spherical Torus Experiment, a source reduction project at the Hanford Site that saved/avoided $36.3 million by recategorizing low-level radioactive waste, and a source reduction project at the Rocky Flats Environmental Technology Site that saved/avoided $33.7 million by reducing secondary waste associated with the packaging and repackaging of transuranic waste.

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Chapter 1
Introduction

Chapter One describes the purpose of the *Annual Report of Waste Generation and Pollution Prevention Progress 1999*, summarizes the computerized data base for collection of waste generation and pollution prevention data for Calendar Year 1999, and outlines the scope of this Report. This Report completes the Calendar Years 1993 through 1999 Secretarial Goal period, and documents DOE's performance in relation to these Goals. New pollution prevention and energy efficiency goals for Fiscal Years 2000 through 2010 were issued by Secretary of Energy Bill Richardson in November 1999, and these new goals are briefly introduced in this Report (Figure 1.1).

Figure 1.1
DOE Complex-Wide Waste Reduction Goals for Achievement by December 31, 1999 (Compared to the 1993 Baseline) vs. the 2005 and 2010 Goals

Goal	by 1999	by 2005	by 2010
For Routine Operations:			
Reduce radioactive (low-level) waste generation	50%	80%	–
Reduce transuranic waste generation	–	80%	–
Reduce low-level mixed waste generation	50%	80%	–
Reduce hazardous waste generation	50%	90%	–
Reduce sanitary waste generation	33%	75%	80%
Reduce total releases and offsite transfers for treatment and disposal of toxic chemicals	50%	90%	–
For All Operations, Including Cleanup/ Stabilization Activities:			
Recycle sanitary waste	33%	45%	50%
For Cleanup/Stabilization:			
Reduce cleanup/stabilization waste generation by 10% annually.			
For Affirmative Procurement:			
Increase procurement of Environmental Protection Agency-designated recycled products to 100 percent, except when items are not commercially available competitively at a reasonable price, or do not meet performance standards.			

1.1 Pollution Prevention Program Mission and Goals

It is an American tradition that our government should protect and serve the people. Over the course of the 20th century, as technology has advanced and priorities have changed, the U.S. Department of Energy's (DOE) mission has also changed.

When DOE assumed its responsibility of securing our national defense through nuclear weapons production, America was in a race to protect its freedom by winning the Cold War. Fifty years later, this mission has evolved from production to stewardship, from secrecy to an open partnership with the public that DOE serves.

Pollution Prevention is part of DOE's evolving mission, and is defined as an activity that reduces or eliminates the release of pollutants and waste into the land, air, or water. DOE's efforts in pollution prevention began with the Office of Defense Programs in 1988. In 1994, DOE published its first *Waste Minimization/Pollution Prevention Program Plan* (DOE/FM-0145), which established DOE's core value of respecting the environment by reducing or eliminating the creation of pollutants or waste at the source.

In 1996, DOE published its *Pollution Prevention Program Plan* (DOE/S-0118), which outlined specific goals issued by the Secretary of Energy for reducing waste generation and the use and release of toxic chemicals. This Plan serves as the principal

cross-cutting guidance to the DOE Complex to fully implement pollution prevention programs within the DOE Complex by December 31, 1999 (Figure 1.1).

Pollution prevention objectives are also addressed in various federal laws and executive orders, including the Pollution Prevention Act of 1990, the Resource Conservation and Recovery Act, and Executive Order 13101 (*Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*).

Executive Order 13101, signed by President Clinton on September 14, 1998, requires all federal agencies to increase their effort in waste prevention, recycling, and the purchase of environmentally preferable products. The complete text of Executive Order 13101 is available on the Internet at **http://www.ofee.gov/eo13101/13101.htm**.

A new goal for reducing waste resulting from cleanup/stabilization activities funded by the Office of Environmental Management was established by DOE in 1999. This goal requires a 10 percent annual reduction in cleanup/stabilization waste through the application of pollution prevention, recycling, and waste minimization practices and techniques, beginning in Fiscal Year 1999.

The Fiscal Year 1999 Performance Agreement (**http://www.cfo.doe.gov/stratmgt**) between President Clinton and Secretary of Energy Richardson stated that future pollution must be prevented by incorporating pollution prevention techniques, including waste minimization, and recycling and reuse of materials, into all DOE activities, in accordance with Executive Order 13101. Success in Fiscal Year 1999 was defined as reducing routine operation waste generation by 45 percent compared to 1993; by reducing/avoiding the generation of radioactive, mixed, and hazardous wastes by 2,000 cubic meters; and by reducing by 10 percent the waste resulting from the execution of cleanup, stabilization, and decommissioning activities from the annual planned baseline volumes. DOE exceeded its commitments for waste reduction in Fiscal Year 1999, and expects to exceed the commitments for Fiscal Year 2000.

1.2 Purpose

The *Annual Report of Waste Generation and Pollution Prevention Progress* is used by DOE managers to assess progress and refine pollution prevention program activities to maximize waste reduction. This Report presents DOE Complex-wide pollution prevention accomplishments and profiles waste generation and recycling efforts at the reporting Operations/Field Offices. Waste generation totals by state are also summarized.

In December 1998, DOE reached a settlement with the Natural Resources Defense Council, Inc. (NRDC) to develop, operate, and maintain an Internet data base of information to enable public participation in the cleanup process at DOE sites. Waste generation data presented in the *Annual Report* is extracted and included in this fiscal year-based data base. The data base was made available on the Internet in early 2000, and must be maintained for a minimum of five years. More information is available at **http://www.em.doe.gov/settlement/**.

1.3 Computerized Data Base

Waste generation and pollution prevention data submitted by DOE reporting sites (Table 1.1, Figure 1.2) are available on the Internet. Waste generation data are searchable by reporting site, Program Secretarial Office, waste type, and calendar year (1996 through 1999). Pollution prevention accomplishment data, including waste reduced and reported cost savings/avoidance, are searchable by pollution prevention activity category, reporting site, waste type, and calendar year (1996 through 1999). DOE's Pollution Prevention Team Web site address is: **http://www.em.doe.gov/wastemin** (select "Pollution Prevention Team") or **http://twilight.saic.com/wastemin/**.

1.4 Scope of the Annual Report

The DOE sites have gathered and reported data on waste generation, waste reduction, reported cost savings/avoidance, quantity of material recycled/reused, pollution prevention accomplishments, and the purchase of EPA-specified items with recycled content (Affirmative Procurement). These Annual Report data are analyzed to assess the following: 1) DOE's overall progress toward achieving its Complex-Wide Waste Reduction Goals, 2) the contribution of each Operations/Field Office to DOE's progress toward achieving these goals, and 3) site pollution prevention achievements (number of projects and corresponding waste reduction and cost savings/avoidance).

It is important to note that for the purpose of this Report, the following assumptions have been made:

- One cubic meter of waste is equivalent to one metric ton of waste.
- Data are rounded, therefore totals in tables and figures may differ slightly from the sum of the data in the tables and figures.
- Waste generation data are reported by the sites as either routine operations or cleanup/stabilization (refer to pages E-1 and E-5 for definitions).
- Transuranic waste totals include mixed transuranic waste.
- Low-level mixed waste totals include low-level mixed and Toxic Substances Control Act (TSCA) mixed wastes.
- Hazardous waste totals include Resource Conservation and Recovery Act regulated, State regulated, and Toxic Substances Control Act regulated waste (refer to page E-2 for definitions).
- Wastewater generation amounts are not collected or reported in this Report.
- Pollution prevention projects include new projects for 1999 and ongoing recycle/reuse projects, and exclude wastewater, ongoing source reduction and segregation projects, and programmatic activities.

All reporting sites identified in the *Annual Report of Waste Generation and Pollution Prevention Progress 1998* are included in this 1999 Report, except for the Weldon Spring Site Remedial Action Project, which did not report in 1999; and the Inhalation Toxicology Laboratory, which is no longer owned by DOE. In 1999, the following site

Table 1.1
1999 DOE Reporting Sites by Operations/ Field Office and Program Secretarial Office*

REPORTING SITE NAME	PROGRAM SECRETARIAL OFFICE
Albuquerque Operations Office	
Grand Junction Projects Office	Environmental Management
Kansas City Plant	Defense Programs
Los Alamos National Laboratory	Defense Programs
Pantex Plant	Defense Programs
Sandia National Laboratories/California	Defense Programs
Sandia National Laboratories/New Mexico	Defense Programs
Waste Isolation Pilot Plant	Environmental Management
Chicago Operations Office	
Ames Laboratory	Office of Science
Argonne National Laboratory – East (including New Brunswick Laboratory)	Office of Science
Argonne National Laboratory – West	Nuclear Energy
Brookhaven National Laboratory	Office of Science
Environmental Measurements Laboratory	Environmental Management
Fermi National Accelerator Laboratory	Office of Science
Princeton Plasma Physics Laboratory	Office of Science
Idaho Operations Office	
Idaho National Engineering and Environmental Laboratory	Environmental Management
Nevada Operations Office	
Nevada Test Site (including North Las Vegas Facility)	Defense Programs
Oak Ridge Operations Office	
East Tennessee Technology Park	Environmental Management
Oak Ridge Institute for Science and Education	Office of Science
Oak Ridge National Laboratory	Office of Science
Oak Ridge Y-12 Plant	Defense Programs
Office of Scientific and Technical Information	Office of Science
Paducah Gaseous Diffusion Plant	Environmental Management
Portsmouth Gaseous Diffusion Plant	Environmental Management
Thomas Jefferson National Accelerator Facility	Office of Science

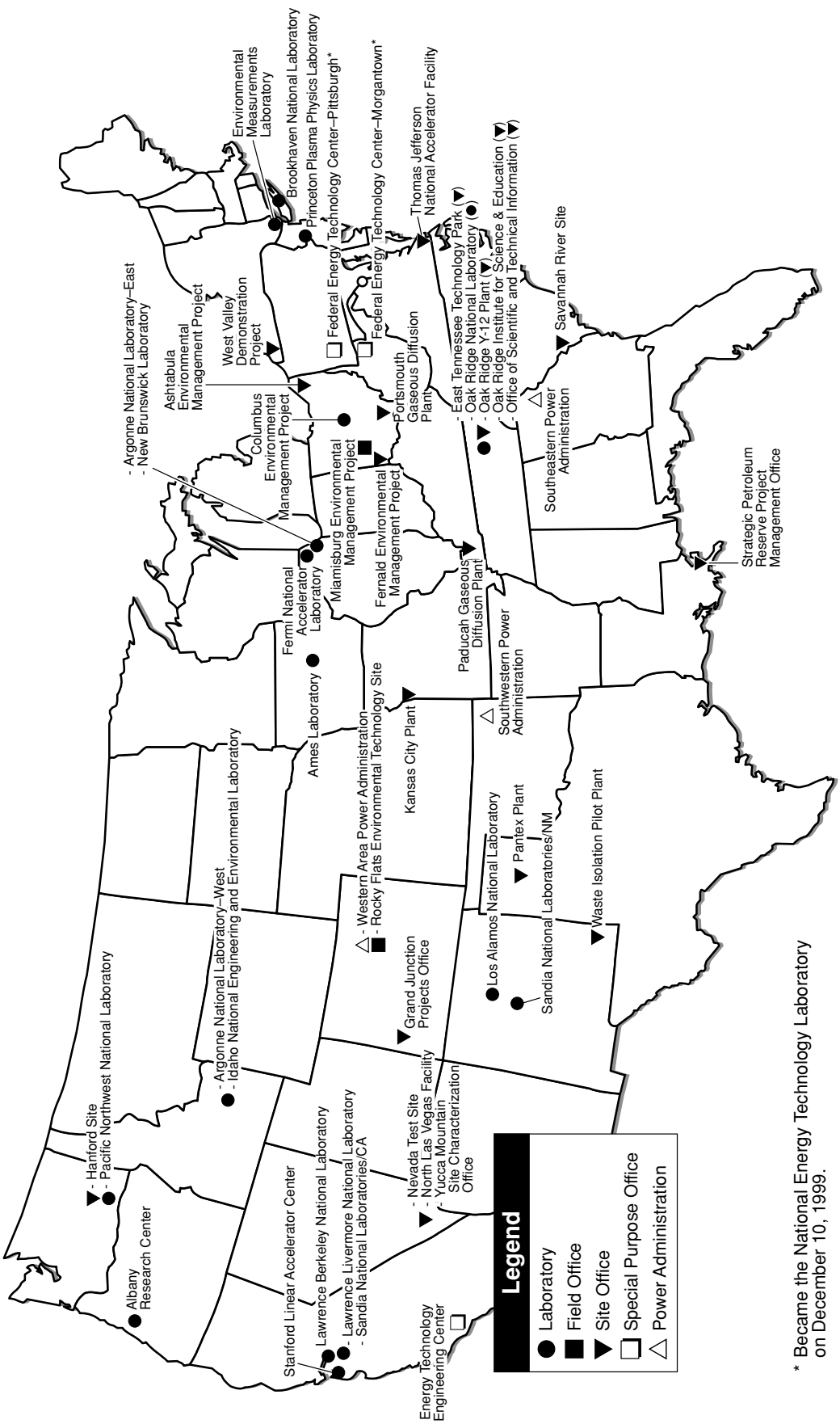
Table 1.1 (Continued) 1999 DOE Reporting Sites by Operations/ Field Office and Program Secretarial Office*

REPORTING SITE NAME	PROGRAM SECRETARIAL OFFICE
Oakland Operations Office	
Energy Technology Engineering Center	Environmental Management
Lawrence Berkeley National Laboratory	Office of Science
Lawrence Livermore National Laboratory	Defense Programs
Stanford Linear Accelerator Center	Office of Science
Ohio Field Office	
Ashtabula Environmental Management Project	Environmental Management
Columbus Environmental Management Project	Environmental Management
Fernald Environmental Management Project	Environmental Management
Miamisburg Environmental Management Project	Environmental Management
West Valley Demonstration Project	Environmental Management
Richland Operations Office	
Hanford Site	Environmental Management
Pacific Northwest National Laboratory	Office of Science
Rocky Flats Field Office	
Rocky Flats Environmental Technology Site	Environmental Management
Savannah River Operations Office	
Savannah River Site	Environmental Management
Headquarters	
Albany Research Center	Office of Fossil Energy
Federal Energy Technology Center – Pittsburgh (including Federal Energy Technology Center – Morgantown)**	Office of Fossil Energy
Southeastern Power Administration	Power Marketing Administration
Southwestern Power Administration	Power Marketing Administration
Strategic Petroleum Reserve Project Management Office	Office of Fossil Energy
Western Area Power Administration	Power Marketing Administration
Yucca Mountain Site Characterization Office	Office of Civilian Radioactive Waste Management

* On April 19, 1999, the Secretary of Energy issued a Memorandum that designated Lead Program Secretarial Offices (LPSOs) for each DOE site. All sites will report to Headquarters through their LPSOs in the future. However, to evaluate progress toward the May 1996 Secretarial Goals, all site data in this 1999 Annual Report have been compiled by Program Secretarial Office (PSO).

** Became the National Energy Technology Laboratory on December 10, 1999.

Figure 1.2
1999 DOE Reporting Sites



name changes were made: Ashtabula Environmental Management Project (formerly RMI Environmental Services), Columbus Environmental Management Project (formerly Battelle Columbus Laboratories), and Miamisburg Environmental Management Project (formerly the Mound Plant). The Albany Research Center reported for the first time in 1999.

All information in this Report is reported for Calendar Year 1999, except for Affirmative Procurement data (Appendix B), which is reported for Fiscal Year 1999, as required by the Office of Management and Budget. Please note that beginning with the next edition of the Annual Report, all information will be reported by fiscal year (so the 1999 Annual Report will be the final calendar year-based Report). This change will make the Annual Report consistent with other DOE data bases and reports.

Affirmative Procurement data presented in this Report include amounts reported by additional sites that are not 1999 Annual Report reporting sites. Please also note that Affirmative Procurement percentages presented in Chapters 2 and 4 of this Report include adjustments for the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards. Both adjusted and unadjusted percentages, however, are presented in Appendix B. Accomplishments for the Toxics Release Inventory (TRI) performance measure are not addressed in this Report because data are not collected as part of this reporting effort.

The DOE reporting sites are responsible for the quality of their data, and have provided explanations when their 1999 waste generation data differed from their 1998 data by more than 20 percent. In addition, corrections to previous years data are reflected in this Report.

The Appendices are organized as follows: Appendix A contains data tables and bar charts illustrating Complex-wide pollution prevention accomplishments and waste generation data, Appendix B contains Affirmative Procurement data, Appendix C provides point of contact information, Appendix D contains a list of pollution prevention Web site addresses, and Appendix E provides a glossary of terms.

Chapter 2

DOE Pollution Prevention Progress

Chapter Two discusses 1999 DOE Complex-wide pollution prevention program performance, summarizes Calendar Year 1999 routine operations and cleanup/stabilization waste generation, illustrates waste generation trends in comparison to the 1993 baseline, and presents waste generation by state.

2.1 DOE Complex-Wide Pollution Prevention Performance

DOE has achieved its Complex-Wide Waste Reduction Goals for routine operations based upon a comparison of 1999 waste generation to the 1993 baseline (Table 2.1). Figure 2.1 illustrates DOE Complex-Wide routine operations waste generation trends by waste type from 1993 through 1999.

Table 2.1 Complex-Wide Calendar Year 1999 Achievements

Number of Pollution Prevention Projects:	**553***
Total Waste Reduced:	**209,605 cubic meters***
Reported Cost Savings/Avoidance:	**$201.2 million***

Category	Performance Measure†	CY 99 Goal
Radioactive Waste	73% reduction	50%
Mixed Waste	76% reduction	50%
Hazardous Waste	92% reduction	50%
Sanitary Waste	59% reduction	33%
Recycling	39% recycled**	33%
Affirmative Procurement	85% purchased	100%

* Excluding wastewater and ongoing source reduction and segregation projects.

** This performance measure does not include approximately 40,900 metric tons of recycled soil at the Lawrence Livermore National Laboratory.

† Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

In addition, DOE has achieved its recycling goal based upon a comparison of 1998 and 1999 recycling amounts. However, for the second consecutive year, the total amount of materials recycled by the Complex decreased. From 1998 to 1999, the total amount of materials recycled by the Complex decreased from 92,800 metric tons to 75,100 metric tons, and the recycling percentage decreased from 55 percent to 39 percent. Most of the sites across the Complex reported a decrease in recycling amounts from 1998 to 1999, with the largest decreases reported by the East Tennessee Technology Park, Hanford Site, Los Alamos National Laboratory, Oak Ridge Y-12 Plant, and the Pantex Plant.

2.2 Pollution Prevention Program Waste Reduction and Reported Cost Savings/Avoidance

In 1999, approximately 209,600 cubic meters of waste were reduced across the DOE Complex through the implementation of pollution prevention projects, contributing to a reported cost savings/avoidance of approximately $201.2 million (Table 2.2). Of the total waste reduced in 1999, low-level radioactive waste accounted for 67 percent, and resulted in a reported cost savings/avoidance of approximately $60 million. Sanitary waste accounted for 29 percent of the total waste reduced in 1999, and resulted in a reported cost savings/avoidance of approximately $83 million. Hazardous waste accounted for two percent of the total waste reduced, and resulted in a reported cost savings/avoidance of approximately $13 million (Table 2.2).

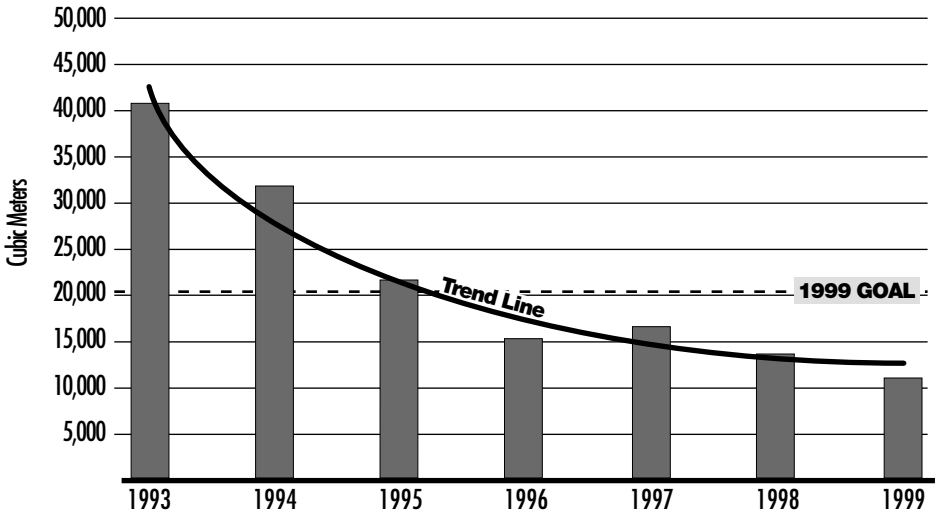
Table 2.2 1999 Complex-Wide Routine Operations and Cleanup/Stabilization Waste Reduction and Reported Cost Savings/Avoidance

Waste Type	Waste Reduction* (in Cubic Meters)	Reported Cost Savings/Avoidance*
High-Level	310	$ 167,800
Transuranic	1,012	$ 34,131,087
Low-Level Radioactive	141,205	$ 60,426,912
Low-Level Mixed	1,880	$ 10,252,963
Hazardous	4,144	$ 13,203,137
Sanitary	61,053	$ 83,008,202
TOTAL	**209,605**	**$ 201,190,101**

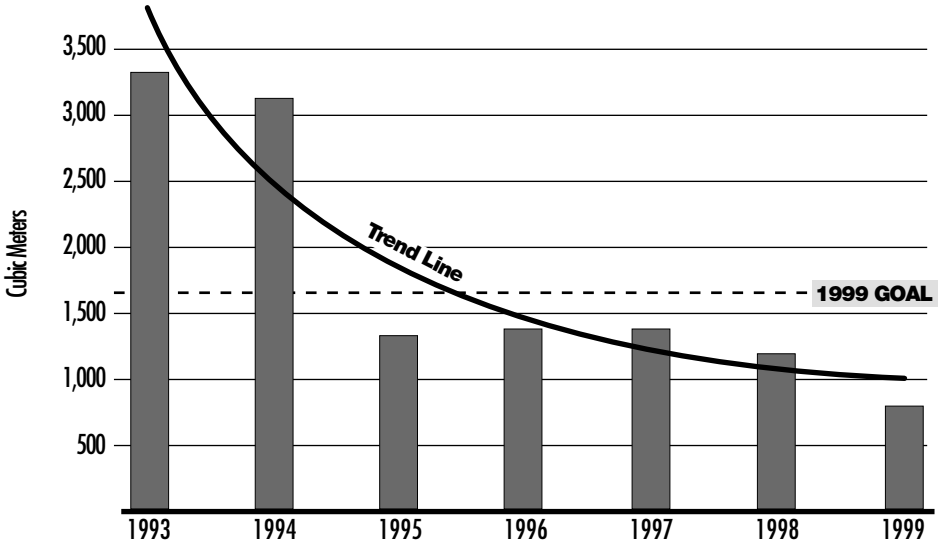
* Excluding wastewater and ongoing source reduction and segregation projects.

Figure 2.1
1993-1999
Complex-Wide Routine Operations Waste Generation Trends by Waste Type

LOW-LEVEL RADIOACTIVE WASTE GENERATION (ROUTINE OPERATIONS)

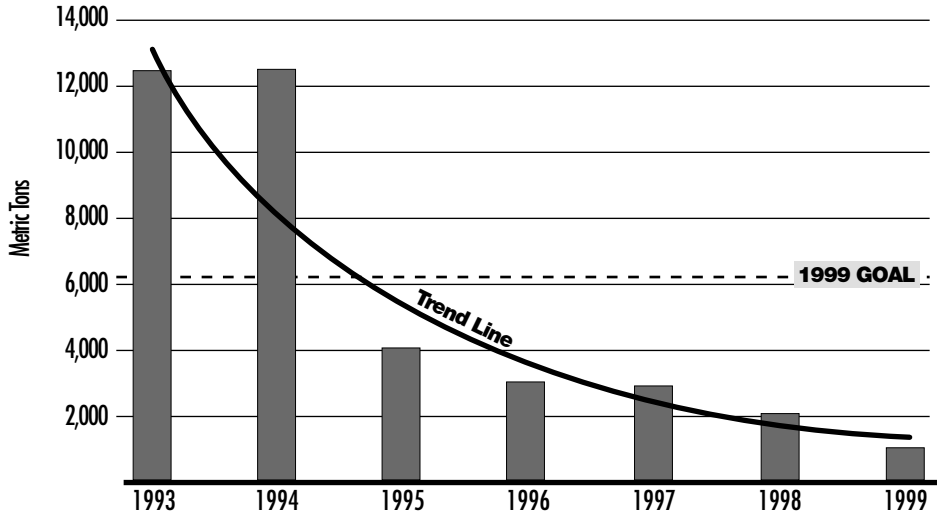


LOW-LEVEL MIXED* WASTE GENERATION (ROUTINE OPERATIONS)



* Includes mixed TSCA waste

HAZARDOUS* WASTE GENERATION (ROUTINE OPERATIONS)



* Includes RCRA regulated, TSCA regulated, and State regulated waste

SANITARY WASTE GENERATION (ROUTINE OPERATIONS)

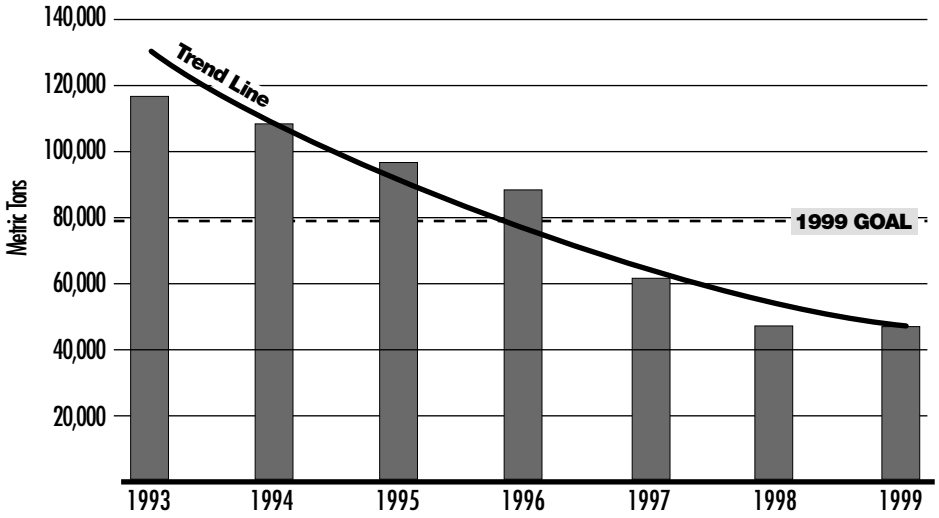


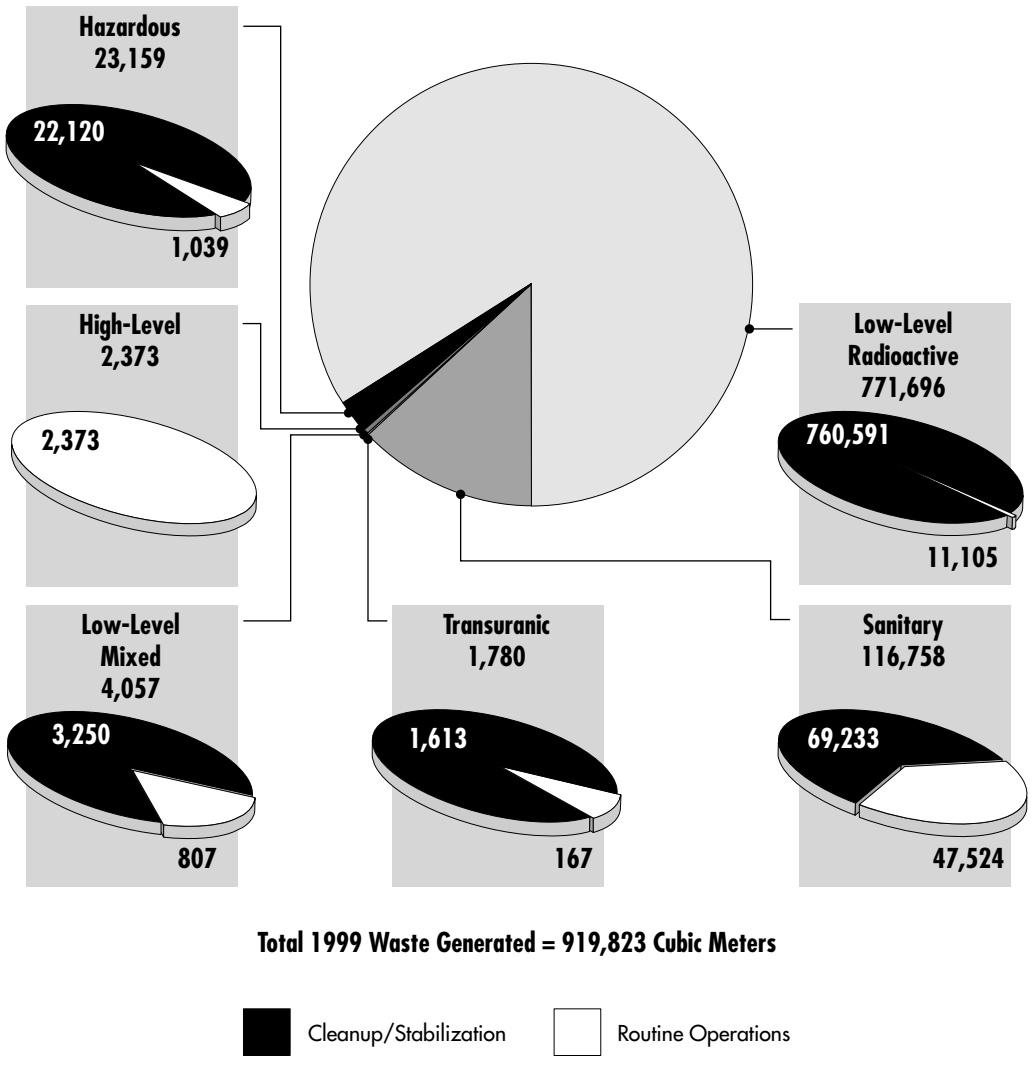
Figure 2.1 (Continued) 1993-1999 Complex-Wide Routine Operations Waste Generation Trends by Waste Type

2.3 Waste Generation

In 1999, the DOE Complex generated approximately 919,800 cubic meters of waste (Figure 2.2). Low-level radioactive, hazardous, and sanitary waste constituted 84 percent, three percent, and 13 percent, respectively, of the total waste generated. High-level, transuranic, and low-level mixed waste combined accounted for less than one percent of the Complex-wide waste generation total.

Most of the Complex's waste resulted from cleanup/stabilization activities (93 percent). Most of the cleanup/stabilization waste (89 percent) was low-level radioactive waste. The largest contributors to cleanup/stabilization low-level radioactive waste generation were the Fernald Environmental Management Project, which contributed 58 percent due to waste from deactivation and decommissioning activities generated for direct placement into the Onsite Disposal Facility; and the Hanford Site, which contributed 38 percent primarily due to soil generated from various remediation activities.

Figure 2.2
1999 Complex-Wide Waste Generation by Waste Type (in Cubic Meters)



2.3.1 Waste Resulting from Routine Operations Activities

Waste resulting from routine operations activities consists of waste produced by any type of production operation; analytical and/or research and development laboratory operations; treatment, storage, and disposal operations; work for others; or any other periodic or recurring work that is considered ongoing in nature.

Sanitary waste, the largest waste type generated, accounted for 75 percent of the total 1999 routine operations waste generated Complex-wide. The generation of routine operations waste decreased from 1993 to 1999 by 74 percent, excluding sanitary waste (Table 2.3).

Table 2.3 1993-1999 Complex-Wide Waste Generation Trends from Routine Operations Activities (in Cubic Meters)

Waste Type	1993	1994	1995	1996	1997	1998	1999
High-Level	1,707	2,071	2,496	2,670	1,994	2,237	2,373
Transuranic	708	546	339	303	266	172	167
Low-Level Radioactive	40,842	31,856	21,848	15,002	16,483	13,627	11,105
Low-Level Mixed	3,321	3,132	1,338	1,372	1,371	1,198	807
Hazardous	12,471	12,539	4,108	3,063	2,877	2,062	1,039
Total Excluding Sanitary Waste	*59,051*	*50,143*	*30,128*	*22,409*	*22,991*	*19,296*	*15,491*
Sanitary*	116,705	108,398	96,567	88,659	61,878	47,618	47,524
GRAND TOTAL	**175,756**	**158,541**	**126,695**	**111,068**	**84,869**	**66,914**	**63,015**

* In 1993, some sites optionally separated and reported sanitary waste as routine operations or cleanup/stabilization waste. Beginning in 1994, sanitary waste was required to be separated and reported as routine operations or cleanup/stabilization.

2.3.2 Waste Resulting from Cleanup/Stabilization Activities

Waste resulting from cleanup/stabilization activities, including primary and secondary waste, is generated by the environmental restoration of contaminated media (e.g., soil, groundwater, surface water, sediments); stabilization of nuclear and non-nuclear (chemical) materials; and deactivation and decommissioning of facilities.

In 1999, the DOE complex generated approximately 856,800 cubic meters of waste from cleanup/stabilization activities, including sanitary waste (Table 2.4). This represents 93 percent of the total DOE waste generated Complex-wide. Waste generated from cleanup/stabilization activities increased 1,587 percent from 1993 to 1999, excluding sanitary waste, due to DOE's aggressive cleanup efforts.

From 1998 to 1999, waste resulting from cleanup/stabilization activities increased for all waste types, except for low-level mixed waste. Transuranic waste resulting from cleanup/stabilization activities increased by approximately 366 percent, mainly due to increased decontamination and decommissioning activities such as residue processing at the Rocky Flats Environmental Technology Site.

Low-level radioactive waste generated from cleanup/stabilization activities increased by approximately 19 percent from 1998 to 1999, primarily due to deactivation and decommissioning activities at the Fernald Environmental Management Project (as previously described).

Hazardous waste generated from cleanup/stabilization activities increased by approximately 66 percent from 1998 to 1999, due to cleanup projects at the Los Alamos

Table 2.4 1993-1999 Complex-Wide Waste Generation Trends from Cleanup/Stabilization Activities (in Cubic Meters)

Waste Type	1993	1994	1995	1996	1997	1998	1999
High-Level	0	0	0	0	0	0	0
Transuranic	458	213	155	203	121	346	1,613
Low-Level Radioactive	11,030	43,701	84,149	64,969	326,544	640,009§	760,591
Low-Level Mixed	3,532	14,023	4,933	2,133	2,167	4,970	3,250
Hazardous	31,674	8,904	22,668	29,901	12,740	13,300	22,120
Total Excluding Sanitary Waste	*46,694*	*66,841*	*111,905*	*97,206*	*341,572*	*658,626*	*787,574*
Sanitary*	23,555	15,145	99,745	73,181	81,849	36,506	69,233
GRAND TOTAL	**70,249**	**81,986**	**211,650**	**170,387**	**423,421**	**695,132**	**856,807**

* In 1993, some sites optionally separated and reported sanitary waste as routine operations or cleanup/stabilization waste. Beginning in 1994, sanitary waste was required to be separated and reported as routine operations or cleanup/stabilization waste.

§ Excludes 11e(2) byproduct material (soil or other material contaminated by extraction or concentration of uranium or thorium). The Grand Junction Projects Office reported 100 cubic meters of 11e(2) byproduct material in 1998.

National Laboratory that disposed of large quantities of asphalt and State regulated contaminated soils.

Sanitary waste generated from cleanup/stabilization activities increased by approximately 90 percent from 1998 to 1999, due to increased disposal of soil, concrete, and asphalt from deactivation and decommissioning activities at the Idaho National Engineering and Environmental Laboratory; a significant increase in construction projects at the Los Alamos National Laboratory; and an increase in construction, deconstruction, and road/sewer repairs at the Sandia National Laboratories/New Mexico.

2.3.3 Waste Generation by State

Table 2.5 presents the total 1999 routine operations and cleanup/stabilization waste generation by waste type for the 21 states where DOE reporting sites are located.

The largest volume of waste, including routine operations and cleanup/stabilization, was generated in the state of Ohio, which accounted for approximately 59 percent of the DOE Complex-wide total in 1999. Most of this waste (97 percent) was cleanup/stabilization waste, primarily generated by the Fernald Environmental Management Project due to continued waste generation from deactivation and decommissioning operations for placement into the Onsite Disposal Facility.

The largest volumes of routine operations waste were generated in the states of Tennessee and South Carolina, which accounted for approximately 18 and 15 percent, respectively, of the DOE Complex-wide routine operations waste generation total in 1999.

Table 2.5 1999 DOE Waste Generation by State and Waste Type (in Cubic Meters)

State	High-Level			Transuranic			Low-Level Radioactive			Low-Level Mixed			Hazardous			Sanitary			GRAND TOTAL
	Routine	Cleanup/ Stabilization	TOTAL	Routine	Cleanup/ Stabilization	TOTAL	Routine	Cleanup/ Stabilization	TOTAL	Routine	Cleanup/ Stabilization	TOTAL	Routine	Cleanup/ Stabilization	TOTAL	Routine	Cleanup/ Stabilization	TOTAL	
California	0	0	**0**	<0.5	0	**<0.5**	191	1,354	**1,544**	32	92	**124**	288	4,043	**4,331**	3,192	3,195	**6,388**	**12,387**
Colorado	0	0	**0**	0	1,426	**1,426**	5	9,090	**9,096**	0	116	**116**	49	11	**59**	2,245	2,793	**5,038**	**15,735**
Idaho	0	0	**0**	1	<0.5	**1**	1,774	1,272	**3,046**	41	88	**129**	32	80	**111**	1,904	24,200	**26,104**	**29,392**
Illinois	0	0	**0**	0	0	**0**	159	52	**211**	1	22	**24**	85	922	**1,007**	925	1,561	**2,486**	**3,727**
Iowa	0	0	**0**	0	0	**0**	2	0	**2**	<0.5	0	**<0.5**	5	0	**5**	0	0	**0**	**8**
Kentucky	0	0	**0**	0	0	**0**	0	411	**411**	0	69	**69**	0	10	**10**	0	4,507	**4,507**	**4,998**
Louisiana	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	2	0	**2**	211	0	**211**	**214**
Missouri	0	0	**0**	0	0	**0**	<0.5	0	**<0.5**	0	0	**0**	65	439	**504**	1,120	0	**1,120**	**1,625**
New Jersey	0	0	**0**	0	0	**0**	34	0	**34**	0	0	**0**	4	19	**23**	82	0	**82**	**138**
New Mexico	0	0	**0**	122	110	**231**	745	841	**1,585**	8	316	**324**	167	15,537	**15,704**	7,361	17,711	**25,073**	**42,918**
New York	0	0	**0**	0	0	**0**	570	347	**917**	5	186	**190**	70	766	**836**	921	197	**1,118**	**3,061**
Nevada	0	0	**0**	0	0	**0**	7	776	**783**	0	43	**43**	18	13	**31**	8,138	5,157	**13,296**	**14,152**
Ohio	0	0	**0**	0	1	**1**	274	452,629	**452,904**	11	587	**598**	2	65	**68**	7,725	4,582	**12,307**	**465,878**
Oklahoma	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	18	31	**49**	25	0	**25**	**74**
Oregon	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	1	7	**7**	222	0	**222**	**229**
South Carolina	2,373	0	**2,373**	42	43	**85**	4,972	1,742	**6,714**	402	1	**403**	27	25	**51**	1,760	3,483	**5,243**	**14,869**
Tennessee	0	0	**0**	<0.5	1	**1**	1,724	2,408	**4,132**	193	1,355	**1,548**	30	20	**50**	9,474	1,456	**10,931**	**16,661**
Texas	0	0	**0**	0	0	**0**	92	314	**405**	1	0	**1**	123	13	**135**	769	0	**769**	**1,311**
Virginia	0	0	**0**	0	0	**0**	3	0	**3**	0	0	**0**	5	0	**5**	218	0	**218**	**227**
Washington	0	0	**0**	1	32	**34**	554	289,355	**289,909**	113	375	**488**	45	121	**165**	892	391	**1,283**	**291,878**
West Virginia	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	5	0	**5**	338	0	**338**	**343**
TOTAL	**2,373**	**0**	**2,373**	**167**	**1,613**	**1,780**	**11,105**	**760,591**	**771,696**	**807**	**3,250**	**4,057**	**1,039**	**22,120**	**23,159**	**47,524**	**69,233**	**116,758**	**919,823**

Chapter 3

Pollution Prevention Accomplishments

Chapter Three discusses Calendar Year 1999 DOE Complex-wide programmatic and site pollution prevention accomplishments, including key pilot programs and new initiatives, waste reduction and reported cost savings/avoidance by pollution prevention activity category, and activities in public involvement, outreach, and research and development.

3.1 Pollution Prevention and Energy Efficiency in Design at DOE Facilities

During 1999, DOE's Office of Energy Efficiency and Renewable Energy worked with the White House in developing Executive Order 13123, Greening the Government Through Efficient Energy Management, which was signed by President Clinton on June 3, 1999. One requirement of Executive Order 13123 is for the Department of Defense and the General Services Administration, in consultation with DOE and the Environmental Protection Agency, to develop sustainable design principles. Executive Order 13123 further requires federal agencies to apply such principles to the siting, design, and construction of new facilities.

The interagency working group recommended incorporating the principles into the Department of the Navy's Whole Building Design Guide (WBDG). The WBDG is a comprehensive, Internet-based portal to a wide range of federal and private sector building-related guidance, criteria, and technology. The WBDG upgrades including sustainable design were initiated in 1999, and were put online in 2000. The WBDG is a living document, which will be updated routinely. The Office of Energy Efficiency and Renewable Energy is currently pursuing inclusion of sustainable design requirements through the DOE directives system.

A presentation on the WBDG was made at *Energy 2000* in Pittsburgh, Pennsylvania, August 21-23, 2000. Computers with Internet access enabled conference participants to browse the WBDG Web page. For more information, visit **http://www.energy2000.ee.doe.gov/**.

3.2 National Metals Recycling Program

The National Center of Excellence for Metals Recycle (NMR) is the DOE Complex-wide lead for aggressively pursuing the recycle and reuse alternatives for scrap and surplus metals. Established in September 1997, this program is designed to educate, promote, and facilitate recycle and reuse opportunities. For more information, contact Vince Adams at 865-576-1803, or at e-mail address AdamsV@oro.doe.gov.

3.3 Pollution Prevention Expert Team

The Pollution Prevention Team within EM-22 has pilot tested the use of complex-wide pollution prevention expert teams for conducting pollution prevention assessments at

DOE cleanup sites to identify opportunities for waste reduction and cost savings. Technical experts with pollution prevention skills in waste management, environmental restoration, and deactivation and decommissioning are funded by EM-22 to review environmental issues, conduct a site assessment, and prepare recommendations to reduce waste and costs and accelerate cleanup schedules. The teams have included a technology development (EM-50) technical representative, and are tailored to meet the specialized cleanup problems to be addressed at each site. The expert team works closely with site project personnel, who make final decisions and are responsible for implementing the recommendations of the team.

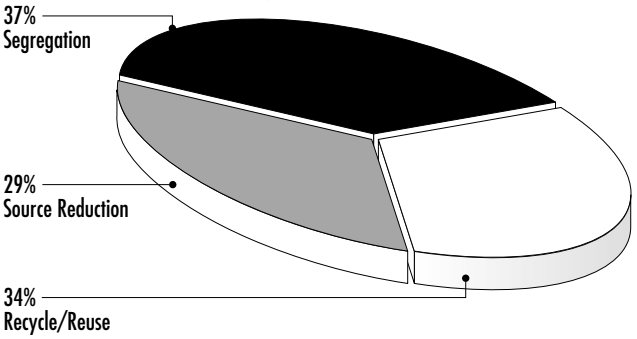
Based on the pilot testing, the expert teams offer the following benefits: 1) the identification and validation of high payback opportunities, 2) the facilitation of complex-wide transfer of best practices and lessons learned at Environmental Management sites that can reduce waste and save disposal costs across DOE, and 3) the transfer of proven EM-50 technologies more rapidly across Environmental Management sites, due to the teams' familiarity with technology development successes.

The expert teams have conducted successful reviews for the restoration project at the Laboratory for Energy Related Health Research (LEHR), the decommissioning of Building 444 at the Rocky Flats Environmental Technology Site, and the decommissioning of the Brookhaven National Laboratory Graphite Research Reactor. These reviews have identified tens of millions of dollars in additional savings beyond those initially identified by the individual sites/projects.

3.4 Accomplishments and Reported Cost Savings/Avoidance by Pollution Prevention Activity Category

In 1999, 34 DOE sites collectively reported 553 pollution prevention projects, with a total waste reduction of approximately 209,600 cubic meters. Note that projects that are primarily waste treatment or solely physical volume reduction (e.g., compaction, repackaging of waste, and reduction of bulk liquid wastes) are excluded. Pollution prevention projects include new projects conducted in 1999 and ongoing recycle/reuse projects, and exclude wastewater, ongoing source reduction and segregation projects, and programmatic activities. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report.

Figure 3.1 1999 Complex-Wide Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)



Total Waste Reduction = 209,605 Cubic Meters

Descriptions of pollution prevention projects, wastewater projects, and programmatic activities can be accessed on the Pollution Prevention Team Web site at **http://www.em.doe.gov/wastemin** (select "Pollution Prevention Team") or **http://twilight.saic.com/wastemin/**.

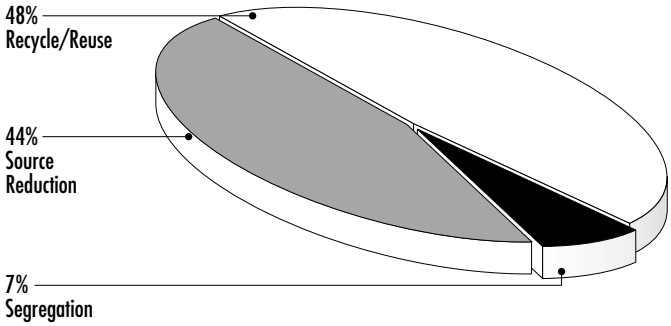
For the purpose of this Report, pollution prevention projects are grouped into three activity categories: source reduction, segregation, and recycle/reuse.

Source reduction projects reduce pollution or waste generated at the source, segregation projects separate materials and/or wastestreams, and recycle/reuse projects divert useful materials from disposal.

Figure 3.1 illustrates waste reduction by pollution prevention activity category for the DOE Complex for 1999. Source reduction projects were responsible for 29 percent of the total 1999 waste reduction, while making up eight percent of the total 1998 waste reduction.

The largest source reduction project, the recategorization of 417 waste sites at the Hanford Site, reduced approximately 48,600 cubic meters of low-level radioactive waste. The largest segregation project, the use of a GR-130 Gamma Spectrometer and E-600 survey instrument to minimize the excavation of contaminated soil at the Hanford Site, reduced 71,200 cubic meters of low-level radioactive waste. The largest recycle/reuse project, the recycling of industrial wastestreams, including scrap metal, used oil, lead acid batteries, and coal ash at the Oak Ridge National Laboratory, reduced approximately 15,700 metric tons of sanitary waste.

Figure 3.2
1999 Complex-Wide Waste Reduction Reported Cost Savings/Avoidance by Pollution Prevention Activity Category



Total Reported Cost Savings/Avoidance = $201,190,101

In addition to the environmental benefits realized from pollution prevention projects, significant financial benefits to DOE and the taxpayer are also realized. In 1999, pollution prevention projects resulted in a total reported cost savings/avoidance of approximately $201.2 million, as compared to $159.4 million in 1998. Figure 3.2 illustrates reported cost savings/avoidance from waste reduction by pollution prevention activity category for the DOE Complex. Forty-eight percent of the total reported cost savings/avoidance in 1999 resulted from recycle/reuse projects. Sixty-five percent of the 1999 reported cost savings/avoidance resulted from three projects: a recycle reuse/project at the Princeton Plasma Physics Laboratory that saved/avoided $61.5 million by reusing systems and equipment in the construction of the National Spherical Torus Experiment; a source reduction project at the Hanford Site that saved/avoided $36.3 million by

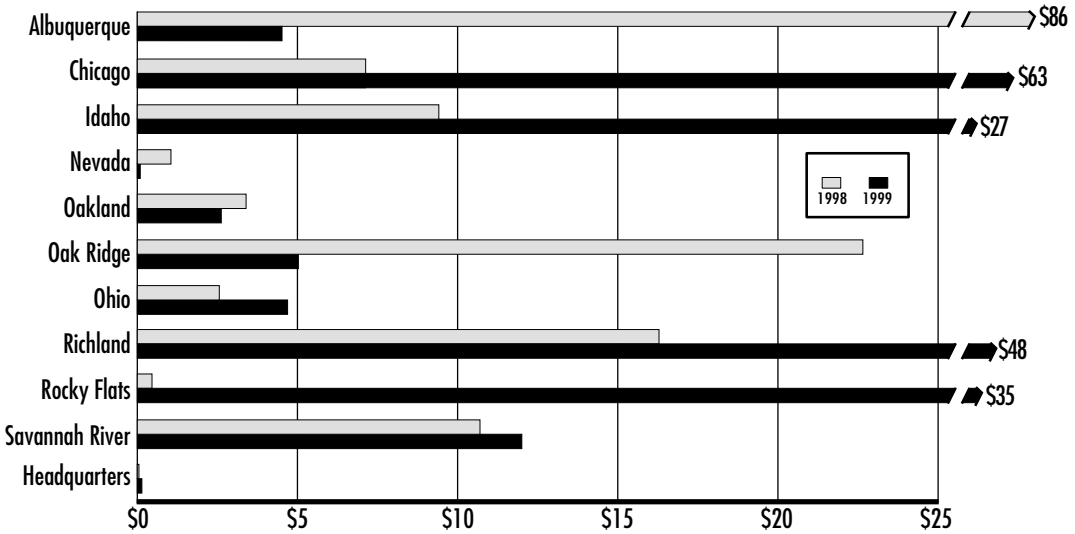
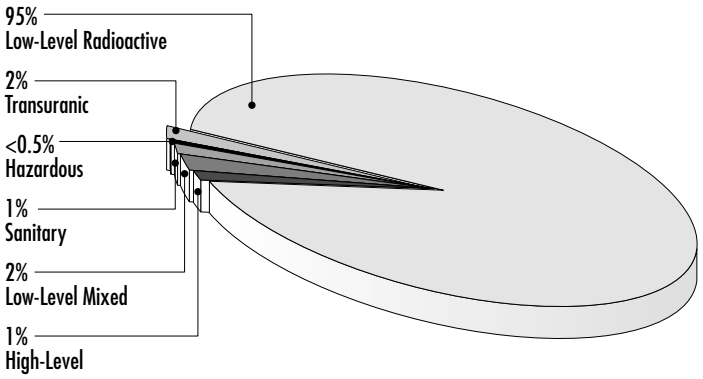


Figure 3.3
Comparison of 1998 and 1999 Reported Cost Savings/Avoidance by Operations/Field Office (in Millions of Dollars)

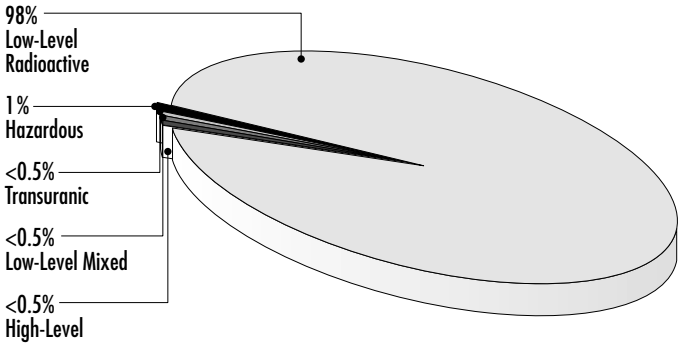
recategorizing low-level radioactive waste; and a source reduction project at the Rocky Flats Environmental Technology Site that saved/avoided $33.7 million by reducing secondary waste associated with the packaging and repackaging of transuranic waste. If the reported cost savings/avoidance from these projects were deducted, the total reported cost savings/avoidance for 1999 would be approximately $70 million, which is a decrease of $89 million compared to 1998's total reported cost savings/avoidance of $159 million. Figure 3.3 presents a comparison of 1998 and 1999 reported cost savings/avoidance for each Operations/Field Office.

Figures 3.4 through 3.6 illustrate waste reduction by waste type for each pollution prevention activity category for the DOE Complex. Figures 3.7 through 3.9 illustrate reported cost savings/avoidance from waste reduction projects by waste type for each pollution prevention activity category for the DOE Complex. Chapter four contains examples of significant accomplishments that contributed to these results.



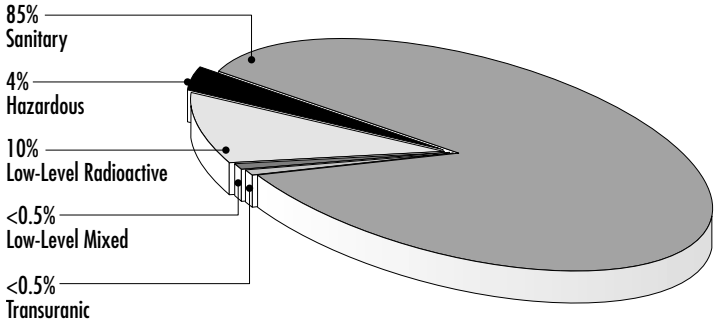
Total Waste Reduced from Source Reduction Projects = 60,038 Cubic Meters

Figure 3.4
1999 Complex-Wide Waste Reduction from Source Reduction Projects by Waste Type



Total Waste Reduced from Segregation Projects = 78,425 Cubic Meters

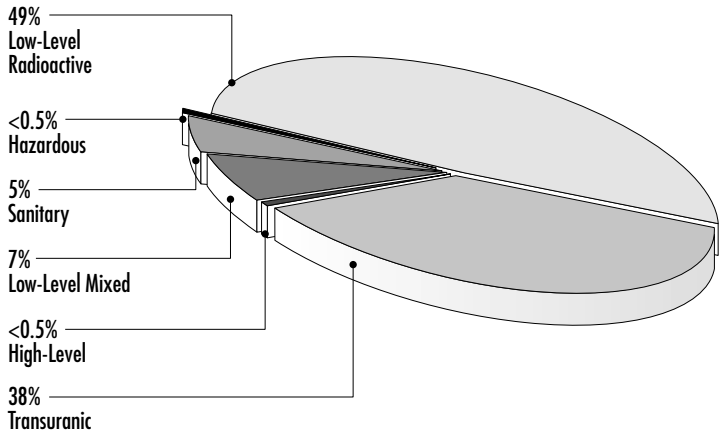
Figure 3.5
1999 Complex-Wide Waste Reduction from Segregation Projects by Waste Type



Total Waste Reduced from Recycle/Reuse Projects = 71,141 Cubic Meters

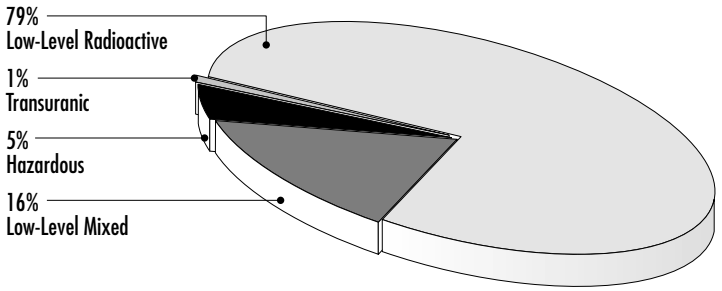
Figure 3.6
1999 Complex-Wide Waste Reduction from Recycle/Reuse Projects by Waste Type

Figure 3.7
1999 Complex-Wide Source Reduction Reported Cost Savings/Avoidance by Waste Type



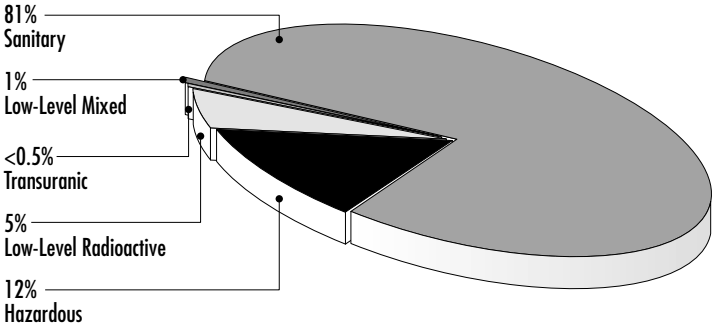
Total Reported Cost Savings/Avoidance from Source Reduction Projects = $89,049,031

Figure 3.8
1999 Complex-Wide Segregation Reported Cost Savings/Avoidance by Waste Type



Total Reported Cost Savings/Avoidance from Segregation Projects = $14,760,498

Figure 3.9
1999 Complex-Wide Recycle/Reuse Reported Cost Savings/Avoidance by Waste Type



Total Reported Cost Savings/Avoidance from Recycle/Reuse Projects = $97,380,572

3.5 Ongoing Source Reduction and Segregation Projects

Ongoing source reduction and segregation projects are projects which were reported for the first time in Calendar Year 1998, but continue to accrue waste reduction and cost savings in Calendar Year 1999. In 1999, 56 ongoing projects were reported across the DOE Complex, for a total waste reduction of 13,742 cubic meters, and a reported cost savings/avoidance of approximately $28.9 million (Table 3.1). Figure 3.10 presents ongoing projects by waste type. Examples of ongoing projects continued in 1999 include:

Table 3.1
1999 Ongoing Source Reduction and Segregation Projects by Operations/Field Office*

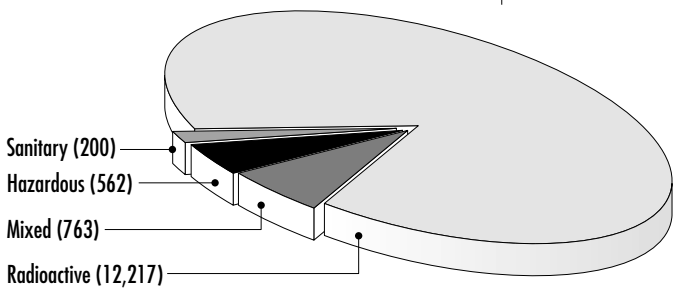
Operations/Field Office*	Number of Ongoing Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Albuquerque	12	954	$ 3,070
Idaho	5	21	$ 209
Oak Ridge	11	5,249	$10,796
Ohio	7	940	$ 606
Richland	2	4,378	$ 5,309
Rocky Flats	5	19	$ 59
Savannah River	14	2,181	$ 8,871
TOTAL	**56**	**13,742**	**$ 28,919**

* Operations/Field Offices that did not report ongoing projects are not included in this table.

- The K-29, K-31, and K-33 buildings at the **East Tennessee Technology Park** are being deactivated and decommissioned. The contractor responsible for this activity will recover the resources it has invested through recycling activities and the delivery of vacated and decommissioned building space. The concept directly supports the reindustrialization of the East Tennessee Technology Park, a key mission of DOE, and results in accelerated cleanup, cost savings, and indirect benefits to the Oak Ridge work force and community. The scheduled end date for this project is December 31, 2003. This segregation activity reduced cleanup/stabilization low-level radioactive waste generation by approximately 3,806 cubic meters and low-level mixed waste by 739 cubic meters, for a combined reported cost savings/avoidance of approximately $10.6 million.

- At the **Savannah River Site**, the High-Level Waste Division's Defense Waste Processing Facility completed the installation of a carbon dioxide pellet decontamination system to avoid the generation of high-level waste. Decontamination is required to prepare process equipment for maintenance work, and the liquid decontamination system currently being used generated significant quantities of liquid waste (spent decontamination solution, rinses, and condensed steam). The carbon dioxide pellet decontamination system decontaminates using the solid/gas phase process, and does not generate liquid waste. The carbon dioxide pellet decontamination system is being used as a substitute for or in conjunction with the liquid decontamination system, depending on the decontamination need; in either case, the generation of liquid decontamination waste is reduced to achieve an equivalent or better decontamination factor on the process equipment. This source reduction activity reduced routine operations high-level waste generation by approximately 382 cubic meters, for a reported cost savings/avoidance of approximately $2 million.

Figure 3.10
Complex-Wide Ongoing Source Reduction and Segregation Projects by Waste Category (in Cubic Meters)



- Soil, water, and hard trash at the **Battelle Columbus Laboratories** were segregated, characterized, and radiologically free-released for municipal disposal. This segregation activity reduced cleanup/stabilization low-level radioactive waste generation by approximately 763 cubic meters, for a reported cost savings/avoidance of approximately $402,000.

- The **Idaho National Engineering and Environmental Laboratory's** Big Shop used a metered paint applicator to eliminate waste paint by metering precise mixtures for vehicle painting. This source reduction activity (a high Return-on-Investment project) reduced routine operations hazardous waste generation by less than one metric ton, for a reported cost savings/avoidance of $19,570.

- The **Pantex Plant** purchased an oil analyzer to enable the changing of lubricating oils based on the oil's ability to continue to meet specifications, rather than on vehicle mileage or equipment run-hours. This resulted in savings from avoided waste disposal, purchase of new oil, and labor costs. This source reduction activity reduced routine operations hazardous waste generation by approximately two metric tons, for a reported cost savings/avoidance of $17,175 (please note that for the purpose of this Report, this waste has been classified as hazardous; this waste was classified by the State of Texas as nonhazardous State regulated Class 1 industrial solid waste).

- The chemical dispensary program at the **Rocky Flats Environmental Technology Site** reviews all orders for chemicals. Waste reductions result from denied orders, restricted quantities, and less hazardous alternatives; savings include avoided procurement and disposal costs. This source reduction activity reduced cleanup/stabilization hazardous waste generation by approximately one metric ton, for a reported cost savings/avoidance of $10,526.

3.6 Wastewater Projects

In 1999, 30 projects that reduced wastewater were reported across the DOE Complex, for a total waste reduction of 102,783 cubic meters, and a reported cost savings/avoidance of approximately $29.9 million (Table 3.2). Please note that wastewater projects are excluded from project totals presented elsewhere in this Report. Figure 3.11 presents wastewater projects by waste type. Examples of wastewater projects completed in 1999 include:

Table 3.2 1999 Wastewater Projects by Operations/Field Office*

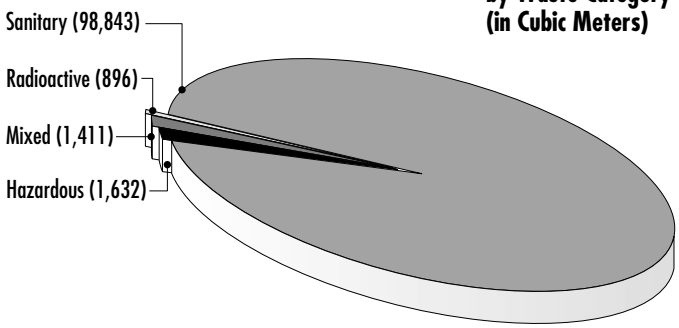
Operations/Field Office*	Number of Wastewater Projects**	Waste Reduction** (Cubic Meters)	Reported Cost Savings/Avoidance** (Thousands)
Albuquerque	4	50,975	$ 76
Chicago	2	63	$ 110
Idaho	2	900	$27,933
Nevada	1	15	$ 4
Oak Ridge	12	49,603	$ 1,451
Richland	3	1,097	$ 60
Rocky Flats	1	4	$ 33
Savannah River	5	126	$ 249
TOTAL	**30**	**102,783**	**$ 29,916**

* Operations/Field Offices that did not report wastewater projects are not included in this table.
** New and ongoing projects are included in this table.

- The **Idaho Nuclear Technology and Engineering Center** (INTEC) reduced the total amount of process wastewater sent to the Process Equipment Waste Evaporator and Tank Farm by 67,498 gallons as a result of increased recycling and sampling inside the New Waste

Calcining Facility. Other INTEC facility modifications and source reduction efforts augmented this waste reduction, including substitution of nonhazardous degreasers, self-stripping coatings for radioactive contamination removal, fixing radioactive contamination methods, a new chemical decontamination method using dilute potassium permanganate and oxalic acid, and installation of a water diversion monitor to divert radioactive water from a cold wastewater system. These source reduction activities reduced the generation of routine operations low-level mixed wastewater by 256 cubic meters, for a reported cost savings/avoidance of approximately $27.9 million.

Figure 3.11 Complex-Wide Wastewater Projects by Waste Category (in Cubic Meters)



- At the **Oak Ridge Y-12 Plant**, the West End Effluent Basin Cleaning project eliminated F-listing through steam cleaning of the basins. The West End Effluent Basin consists of three in-ground, open, concrete basins, with a total area of 3,600 square feet. Two of the three basins were able to be decontaminated. These open basins are used to store polished effluent from the West End Treatment Facility, flood waters from inside contaminated buildings, and rainfall. This segregation activity reduced the generation of routine operations hazardous wastewater by approximately 229 metric tons, for a reported cost savings/avoidance of $222,500.

- The **Oak Ridge National Laboratory's** laboratory building and operations water systems were evaluated. As a result, changes were implemented, resulting in reduced electrical operational costs, reduced blow-down to wastestreams and water make-up by approximately 21.3 million gallons, reduced chiller maintenance, extended life of equipment, minimized drum disposal, and reduced potential for environmental insults and health hazards associated with Legionella bacteria. With an annual program cost of $30,000, this project will save $500,000 annually in utility costs, chemicals costs, and drum management. This recycle/reuse activity reduced the generation of routine operations sanitary wastewater by approximately 20,131 metric tons, for a reported cost savings/avoidance of $125,000 in 1999.

- The **Princeton Plasma Physics Laboratory** continues to use a micropurge system for groundwater sampling of monitoring wells. Dedicated pumps are permanently installed in each well, reducing wastewater generation by 93 percent. This source reduction activity reduced the generation of cleanup/stabilization hazardous wastewater by approximately 62 metric tons, for a reported cost savings/avoidance of $100,000.

- The Environmental Restoration Division at the **Savannah River Site** completed a hazardous waste source reduction initiative involving the optimization of the A/M Area Groundwater Monitoring Wells, which avoided the generation of over 5,200 cubic feet of hazardous wastewater, saving over $134,000 per year. Optimization of the A/M Area monitoring well network using a process to evaluate well relevancy, reliability, regulatory requirements, and redundancy resulted in the following South Carolina Department of Health and Environmental Control approved changes to the monitoring program: 1) Elimination of 14 wells from routine (semi-annual) ground

water sampling, and 2) Reduction of chemical analyses for laboratory analyses. This source reduction activity reduced the generation of cleanup/stabilization hazardous wastewater by approximately 74 metric tons, for a reported cost savings/avoidance of approximately $66,900.

- Micropurge bladder pumps were installed in 31 regularly sampled groundwater monitoring wells at the **Rocky Flats Environmental Technology Site**, resulting in a reduction in wastewater volume, a significant savings in purge water treatment costs, and decreased labor costs. This source reduction activity reduced the generation of cleanup/stabilization low-level radioactive wastewater by approximately four cubic meters, for a reported cost savings/avoidance of $33,000.

- At the **Sandia National Laboratories/New Mexico**, an electronic x-ray system was purchased using Generator Set-Aside Fee funding. The electronic system replaced an old photochemical processing operation, reducing chemical waste and wastewater. This source reduction activity reduced the generation of routine operations sanitary wastewater by approximately 20 metric tons, for a reported cost savings/avoidance of $29,100.

3.7 Programmatic Activities

Projects such as energy and air emission reduction, pollution prevention opportunity assessments, public awareness, research and development, training, or outreach activities are not included in pollution prevention project totals in this Report. These projects are defined as programmatic activities, and are presented in this section. Although these projects do not result in quantifiable waste reductions or cost savings/avoidance, they are critical in promoting pollution prevention, and are encouraged and supported by DOE. Projects demonstrating programmatic activities within the DOE Complex in 1999 include:

Albuquerque Operations Office

- Two of five new air-cooled chiller units were installed at the **Pantex Plant**, which saved $18,000. When all five of the new chiller units have been installed, the Pantex Plant will have achieved the Secretary's Year 2005 Goal for replacement of chillers over 150 ton capacity using Class 1 Ozone Depleting Substance (ODS) refrigerant.

- The Building 858 cooling and control system was upgraded at the **Sandia National Laboratories/New Mexico**. The upgrade reduced energy costs for the facility, and reduced the generation of greenhouse gas emissions associated with electrical consumption.

Chicago Operations Office

- Through the use of DOE's Complex-Wide Material Exchange, the **Argonne National Laboratory - East** has been able to obtain a variety of equipment and materials from

other DOE facilities, for a total cost savings of over $150,000. Items obtained include an ultrasonic cleaner/decontaminator, a soil venting halocarbon destructor, and lead shot from the **Sandia National Laboratories/New Mexico**; and two rare earth chemicals from the **Stanford Linear Accelerator**.

- Enthalpy (heat content) economizers on four air handling units in the **Princeton Plasma Physics Laboratory's** largest office building were placed on direct digital control. Annually, this action will save approximately 320,540 kilowatt-hours of electricity, for an estimated cost savings of $19,232, and will reduce electrical power plant air emissions by 235 metric tons.

Idaho Operations Office

- Approximately 3,900 employees (65 percent of the work force) at the **Idaho National Engineering and Environmental Laboratory** participated in site-wide environmental awareness activities designed to teach and encourage environmental protection. This initiative was part of an ongoing effort to implement the Integrated Safety Management System, and to obtain registration with the International Standard ISO 14001 Environmental Management System.

Nevada Operations Office

- Earth Day was celebrated during the week of April 18, 1999, at facilities at the **Nevada Test Site**. Events included a pollution prevention exhibit, distribution of pollution prevention literature, and distribution of promotional items.

Oakland Operations Office

- In January 1999, the **Lawrence Livermore National Laboratory** (LLNL) published a report, *1997 Comprehensive Opportunity Assessment for Pollution Prevention at LLNL*, (UCRL-AR-127890-97). The report details sources of the top 20 wastestreams, and suggests pollution prevention methods and opportunities that can be applied to these wastestreams.

Oak Ridge Operations Office

- At the **Oak Ridge Reservation**, as excess materials and equipment are identified, they are entered into a data base known as the "Swap Shop." Personnel can then browse the data base, select needed materials or equipment, and arrange for pickup or delivery of available items, reducing the purchase of new items. In Calendar Year 1999, the **East Tennessee Technology Park** Swap Shop Coordinator reported a total of 535 swaps, with an estimated cost savings/avoidance of $166,855.

- The **Oak Ridge National Laboratory's** (ORNL) Pollution Prevention Strategic Plan was finalized. The Plan focuses on pollution prevention activities that support the

overall mission of ORNL to conduct scientific research. A budget proposal was approved for the top four projects: 1) instituting a chemical store to dispense required quantities of chemicals, which will reduce the amount of unused chemicals requiring management and disposal; 2) instituting a "Green is Clean" program to manage non-contaminated waste from radiological areas as sanitary waste instead of as solid low-level radioactive waste; 3) promoting and institutionalizing metals recycling; and 4) developing contracts that reduce the amount of packaging waste, and that will accept used products for reprocessing/reuse.

- Pollution Prevention/Waste Minimization Awareness E-Mail Messages were sent to all employees and subcontractors as part of the **Portsmouth Gaseous Diffusion Plant's** Pollution Prevention Awareness campaign. Articles published in professional trade publications and newspapers on source reduction, substitution, waste prevention, and recycling were distributed by e-mail.

Ohio Field Office

- Excess materials in controlled storage were listed on the **West Valley Demonstration Project's** Intranet Web site for reuse, for a reported cost savings/avoidance of $123,690.

- Pollution Prevention (P2) Coordinators sponsored employee events at the **West Valley Demonstration Project** to increase awareness and participation in the Pollution Prevention Program. "Planet Earth Jeopardy" games on general and site-specific environmental issues were played during lunch. The P2 Program set up two booths at the site's Safety Fair to promote the Pollution Prevention Program. At one booth, a game called "Wheel of Mis-Fortune" asked questions pertaining to health, safety, and environmental issues; the other booth presented information on the Affirmative Procurement Program. In addition, guest speakers presented slide presentations during lunch seminars (topics included the preservation of America's national parks, and scenic nature treasures found in Western New York).

Richland Operations Office

- An excess concrete crusher, attachment, and inventory of spare parts at the **Hanford Site** were transferred to the **Miamisburg Environmental Management Project** in Ohio. The equipment will be used at several Department of Energy sites at the Ohio Field Office for crushing concrete demolition waste from environmental restoration activities. By using the crusher, DOE expects to save $4-to-$12 million in disposal costs over a three year period. In addition, the crusher transfer eliminated the need to purchase a new crusher, for an estimated avoided purchase cost of $750,000.

- The following Pollution Prevention Opportunity Assessments (PPOAs) were conducted at the **Hanford Site** in Calendar Year 1999: "Tank Waste Remediation Systems Diversion Pits MLLW/LLW" investigated the use of less waste intensive ventilation technology; "Waste Sampling and Characterization Facility (WSCF)

MLLW/LLW Generation" examined various aspects of WSCF's sample acceptance and analytical procedures; "Fluorescent Light Ballast Containing Polychlorinated Biphenyl" investigated alternative lighting; "Analytical Waste Generation at 222S Laboratory" investigated less waste-intensive analytical technologies and techniques; "Alternative Machine Coolants" investigated the use of non-regulated coolants as well as air cooled machining technology; and "Tank Farms Operations and Maintenance Activities" investigated wood and plastic uses at Tank Farms. These PPOAs either had site-wide implications, or were focused on reducing waste volumes for major generators. The opportunities, identified as having a payback of three years or less, have a projected annual waste reduction of approximately 10 cubic meters of low-level radioactive waste, approximately three cubic meters of low-level mixed waste, and approximately one metric ton of hazardous waste, for a combined reported cost savings/avoidance of $199,000.

- An energy consumption study was performed on two identical co-located buildings at the **Pacific Northwest National Laboratory**. By adjusting thermostat temperatures, recalibrating control software, and replacing equipment, energy use decreased 8,300 kilowatt-hours per day, for an estimated cost savings of $90,000 annually.

Rocky Flats Field Office

- The implementation of innovative technologies at the **Rocky Flats Environmental Technology Site** has reduced the amount of transuranic waste destined for disposal. The Pipe Overpack Container, Gas Generation Testing Canister, and Filtered Bag-Out Bag allow more radioactive material to be placed into each 55-gallon waste drum, while meeting all transportation and waste acceptance requirements. These three technologies have saved $190 million in waste management and disposal costs, and have reduced the number of drums destined for disposal at the **Waste Isolation Pilot Plant** by 23,600 drums.

Savannah River Operations Office

- The Technical Services Division at the **Savannah River Site** completed a project that eliminated 34 pounds of air emissions from a diesel generator located at Building 754-4A, and saved approximately $37,000 per year in maintenance and operating costs. When performing 754-4A diesel generator load tests, the computer system that the generator powered had to be shut down and then restarted following each test. To eliminate this process, a diesel generator located in Building 773-A with a paralleling capability that could be load tested online without affecting the connected loads was connected to the computer system, so the computer system did not have to be shut down during load tests. This project eliminated the need for the 754-4A diesel generator, which reduced air emissions, maintenance, and operating costs.

Headquarters

- A Pollution Prevention Opportunity Assessment (PPOA) was performed at the **Yucca Mountain Site Characterization Project** to analyze their method of used oil filter disposal. Used oil filters were collected, drained, and then transported to an offsite industrial landfill for disposal. The PPOA identified an alternative method where a contractor would pick up the used oil filters, and would completely recycle/reuse the constituents, thereby eliminating the need for landfill space. The oil filters would be heated to remove the liquid oil for recycling; the canisters would be shredded, the metal would be recycled into construction rebar, and the gaskets would be sent offsite for materials recovery; and the oil-impregnated paper would be used as a high British thermal unit fuel in a hydrocarbon-contaminated soil thermal desorbtion unit. The recycling process identified by the PPOA costs slightly more than the current method of disposal, but is a more environmentally proactive approach, and aligns well with the philosophy of Executive Order 13101.

3.8 Pollution Prevention Conference and Awards Program

The Pollution Prevention Team, EM-22, sponsors a Pollution Prevention Conference where attendees can participate in training sessions and seminars, and gather and share information on pollution prevention practices and techniques. The *1999 DOE National Pollution Prevention Conference Report* details pollution prevention recommendations resulting from the November 1999 Pollution Prevention Conference, and is available at **http://www.em.doe.gov/wastemin** (select "Pollution Prevention Team") or **http://twilight.saic.com/wastemin/**. The next conference is scheduled for June 18-22, 2001, to be held in Albuquerque, New Mexico.

The Pollution Prevention Team recognizes and congratulates DOE's best performers in pollution prevention through an annual awards ceremony. The 2000 awards will be presented in Washington, DC, in October 2000 (Table 3.3). More information is available at **http://www.em.doe.gov/wastemin** (select "Pollution Prevention Team") or **http://twilight.saic.com/wastemin/**.

Table 3.3
Pollution Prevention Awards, 2000

Individual Awards

Award Category	Project Title	Award Recipient
EO 12856 Individual Challenge	*Savannah River Site Pollution Prevention Program*	Dr. Karen Hooker, Savannah River Site
Model Facility Demonstration	*Outstanding Contribution to Hanford's Pollution Prevention Success*	Donna Merry, Hanford Site

Pollution Prevention Awards

Award Category	Project Title	Award Recipient
Affirmative Procurement	*ANL-E Affirmative Procurement Program Activities (FY99)*	Argonne National Laboratory - East
Affirmative Procurement	*An Affirmative Procurement Showplace at the Idaho National Engineering and Environmental Laboratory*	Idaho National Engineering and Environmental Laboratory
Complex-Wide Achievement	*National Center of Excellence for Metals Recycle*	Oak Ridge Operations Office
Environmental Preferability	*Non-Lead Ammunition at Oak Ridge's Firing Range*	Oak Ridge Operations Office
Environmental Restoration	*Composting of High Explosive-Contaminated Soil at Pantex*	Pantex Plant
Information Sharing	*SRS Large Scale Demonstration and Deployment Project*	Savannah River Site
Integrated Planning and Design	*Integrated Plan to Re-use Concrete in Ohio Region*	Miamisburg Environmental Management Project (formerly the Mound Plant)
Sowing the Seeds for Change	*Pollution Prevention Opportunity Assessments for Research and Development*	Pacific Northwest National Laboratory
Outreach	*PNNL Commits to Help the Community Prevent Pollution*	Pacific Northwest National Laboratory
Outreach	*Environmental Excellence in Pollution Prevention*	Idaho National Engineering and Environmental Laboratory
Recycling	*The Copper Wire and Windings Project – A Team Approach to Materials Reuse*	Fernald Environmental Management Project
Waste Prevention	*Electrolytic Decontamination of Gloveboxes*	Los Alamos National Laboratory

Chapter 4 *Operations/Field Office Pollution Prevention Progress*

Chapter Four summarizes Calendar Year 1999 DOE Complex-wide waste generation, waste reduction, and recycling data, and presents 1999 Operations/Field Office waste generation and waste reduction data. Each Operations/Field Office mission is identified, pollution prevention performance and accomplishments are summarized for each reporting site, and waste generation data is presented by Program Secretarial Office and waste type.

4.1 DOE Complex-Wide Waste Generation and Pollution Prevention Accomplishments

There are 10 Operations/Field Offices within the DOE Complex: Albuquerque, Chicago, Idaho, Nevada, Oakland, Oak Ridge, Ohio, Richland, Rocky Flats, and Savannah River. All 10 Operations/Field Offices oversee sites that reported radioactive, hazardous, and sanitary waste generation in 1999. Headquarters sites reported only hazardous and sanitary waste generation in 1999.

Table 4.1 illustrates 1999 waste generation, waste reduction, and reported cost savings/avoidance by Operations/Field Office. Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Tables 4.2 and 4.3 present waste generation by Operation/Field Office for routine operations and cleanup/stabilization activities, respectively. Figures 4.1 through 4.3 depict 1999 waste reduction by Operation/Field Office from source reduction, segregation, and recycle/reuse projects, respectively, excluding wastewater projects and ongoing source reduction and segregation projects.

Table 4.1 1999 Waste Generation, Waste Reduction, and Reported Cost Savings/Avoidance by Operations/Field Office

Operations/Field Office	Waste Generation (Cubic Meters)	Waste Reduction* (Cubic Meters)	Reported Cost Savings/Avoidance*§ (from Waste Reduction)
Albuquerque	46,435	8,991	$ 4,566,984
Chicago	7,230	5,992	$62,503,691
Idaho	28,013	8,501	$26,928,503
Nevada	13,470	1,223	$ 100,540
Oakland	11,985	2,523	$ 2,692,120
Oak Ridge	22,510	32,274	$ 5,050,556
Ohio	466,336	9,132	$ 4,654,368
Richland	291,878	129,563	$47,614,269
Rocky Flats	13,638	4,799	$34,872,943
Savannah River	14,869	2,449	$12,064,877
Headquarters	3,458	4,158	$ 141,250
TOTAL	**919,823**	**209,605**	**$ 201,190,101**

* Excluding wastewater and ongoing source reduction and segregation projects.

§ Numbers have been rounded to the nearest whole dollar.

Richland, Oak Ridge, Ohio, and Albuquerque represent the Operations/Field Offices that reduced the most waste in 1999. The top contributors to reported cost savings/avoidance within the DOE Complex in 1999 were the Chicago, Richland, Rocky Flats, and Idaho Operations/Field Offices. In total, the DOE Operations/Field Offices have

Table 4.2
1999 Routine Operations Waste Generation by Operations/Field Office and Waste Type (in Cubic Meters)

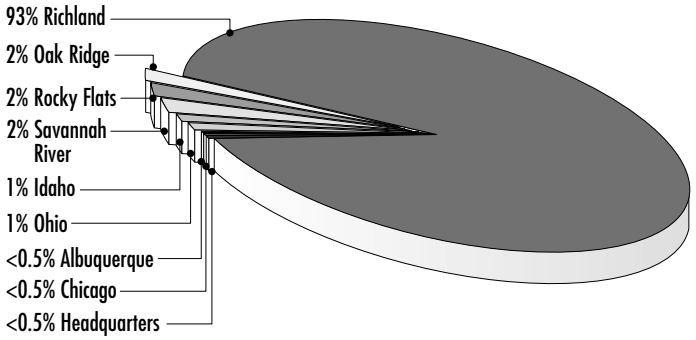
ROUTINE OPERATIONS

Operations/Field Office	High-Level	Transuranic	Low-Level Radioactive	Low-Level Mixed	Hazardous	Sanitary
Albuquerque	0	122	842	9	379	9,609
Chicago	0	1	716	6	160	2,425
Idaho	0	0	1,493	40	30	1,117
Nevada	0	0	7	0	17	7,457
Oakland	0	<0.5	191	32	262	3,010
Oak Ridge	0	<0.5	1,727	193	35	9,693
Ohio	0	0	603	12	8	8,015
Richland	0	1	554	113	45	892
Rocky Flats	0	0	0	0	0	556
Savannah River	2,373	42	4,972	402	27	1,760
Headquarters	0	0	0	0	76	2,991
TOTAL	**2,373**	**167**	**11,105**	**807**	**1,039**	**47,524**

Table 4.3
1999 Cleanup/ Stabilization Waste Generation by Operations/Field Office and Waste Type (in Cubic Meters)

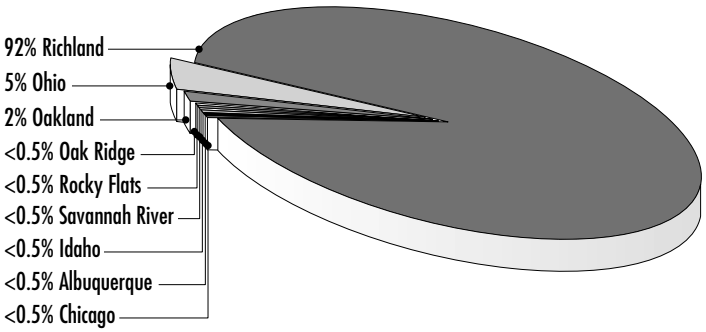
CLEANUP/STABILIZATION

Operations/Field Office	High-Level	Transuranic	Low-Level Radioactive	Low-Level Mixed	Hazardous	Sanitary
Albuquerque	0	110	1,159	316	16,036	17,853
Chicago	0	0	401	236	1,724	1,561
Idaho	0	<0.5	1,011	60	62	24,200
Nevada	0	0	776	43	13	5,157
Oakland	0	0	1,349	92	3,996	3,053
Oak Ridge	0	1	3,146	1,716	36	5,963
Ohio	0	1	452,562	295	59	4,779
Richland	0	32	289,355	375	121	391
Rocky Flats	0	1,426	9,090	116	10	2,441
Savannah River	0	43	1,742	1	25	3,483
Headquarters	0	0	0	0	38	352
TOTAL	**0**	**1,613**	**760,591**	**3,250**	**22,120**	**69,233**



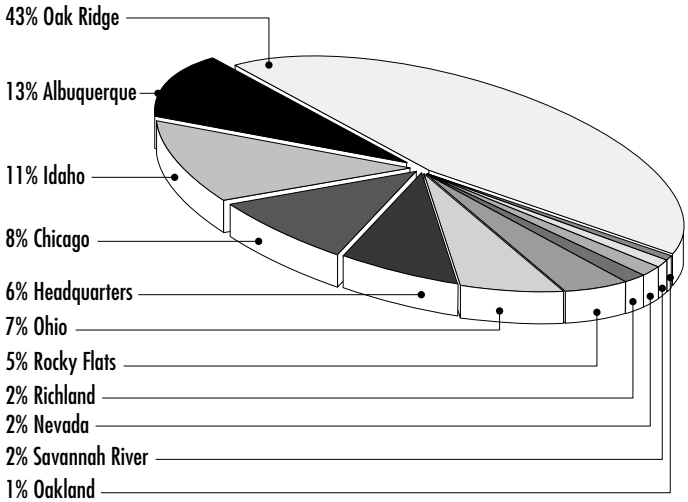
Total Waste Reduced by Source Reduction Projects = 60,038 Cubic Meters

Figure 4.1
1999 Waste Reduction by Operations/Field Office from Source Reduction Projects



Total Waste Reduced by Segregation Projects = 78,425 Cubic Meters

Figure 4.2
1999 Waste Reduction by Operations/Field Office from Segregation Projects



Total Waste Reduced by Recycle/Reuse Projects = 71,141 Cubic Meters

Figure 4.3
1999 Waste Reduction by Operations/Field Office from Recycle/Reuse Projects

contributed to approximately $201.2 million total reported cost savings/avoidance in 1999 due to prudent pollution prevention practices. Sixty-five percent of this reported cost savings/avoidance resulted from three projects. If the reported cost savings/avoidance from these projects were deducted, the total reported cost savings/avoidance for 1999 would be approximately $70 million, which is a decrease of $89 million compared to 1998's total reported cost savings/avoidance of $159 million. These projects include a recycle/reuse project at the Princeton Plasma Physics Laboratory that saved/avoided $61.5 million by reusing systems and equipment in the construction of the National Spherical Torus Experiment, a source reduction project at the Hanford Site that saved/avoided $36.3 million by recategorizing low-level radioactive waste, and a source reduction project at Rocky Flats Environmental Technology Site that saved/avoided $33.7 million by reducing secondary waste associated with packaging and repackaging transuranic waste.

4.2 DOE Complex-Wide Recycling Activities

Approximately 72 percent of the pollution prevention projects reported in 1999 involved recycling activities, resulting in more than 75,000 metric tons of materials recycled. Recycling activities are traditionally associated with sanitary waste; however, radioactive and hazardous waste reductions also result from recycling activities. Fifty-six percent of the recycling projects reported in 1999 reduced sanitary waste. By contrast, 10 percent, two percent, and 32 percent of the recycling projects reduced radioactive, mixed, and hazardous waste, respectively. Examples of recyclable materials are listed below, and a breakdown of materials recycled in 1999 is presented in Table 4.4.

- Paper Products - office and mixed paper, corrugated cardboard, newspaper, phone books, magazines
- Scrap Metals - stainless steel, copper, iron, aluminum, aluminium cans, lead, zinc, and other types of metals not clarified
- Precious Metals - silver, gold, platinum, and other types of metals not clarified
- Automotive - batteries, engine oils, and tires
- Other - glass, plastic, styrofoam, toner cartridges, food waste, concrete, wood, engine coolant, and any other items that do not fit into the previous categories

Please note that data may have been rounded in the following pages of this Chapter, the Program Secretarial Office (PSO) waste generation pie charts do not include sanitary waste (as this data is not collected by PSO), and pollution prevention project data excludes wastewater projects and ongoing source reduction and segregation projects.

Table 4.4
1999 DOE Recycling Activities by Operations/Field Office (in Metric Tons)

Operations/Field Office	Paper Products	Metals†	Automotive	Other	Other Explanations††	TOTAL†††
Albuquerque	1,357	2,797	256	10,073	Largest contributors include 6,170 metric tons of concrete and 1,420 metric tons of debris due to decommissioning and deactivation.	14,483
Chicago	1,032	2,755	75	3,753	Largest contributors include 1,270 metric tons of debris from construction and demolition, 810 metric tons of concrete, 560 metric tons of combustion fly ash, and 470 metric tons of coal fines.	7,615
Idaho	37	7,483	56	1,203	Largest contributors include 850 metric tons of excess items such as scrap material, tools, building materials; excess computer or computer-related equipment; communication, industrial, automotive, and other equipment for reuse; and 190 metric tons of wood.	8,779
Nevada	312	717	45	112	Largest contributor includes 70 metric tons of used oil.	1,186
Oakland	648	2,926	38	6,101§	Largest contributors include 3,070 metric tons of concrete and 2,080 metric tons of asphalt.	9,713
Oak Ridge	845	4,298	174	10,305	Largest contributors include 5,900 metric tons of coal ash used as fill material and 2,340 metric tons of coal ash recycled for other purposes.	15,622
Ohio	269	2,748	9	580	Largest contributors include 250 metric tons of concrete and 240 metric tons of excess chemicals, scrap lumber, and wood.	3,606
Richland	630	601	89	350	Largest contributors include 130 metric tons of wood and an 80 metric ton concrete crusher.	1,670
Rocky Flats	370	1,252	29§§	1,304	Largest contributor includes 1,140 metric tons of concrete.	2,955
Savannah River	707	1,051	4	1,536	Largest contributors include 1,260 metric tons of railroad cross-ties and telephone poles, and 220 metric tons of computers and office equipment.	3,297
Headquarters	561	1,429	98	4,068	Largest contributors include 1,450 metric tons of asphalt, 1,130 metric tons of wood poles and cross arms, 720 metric tons of concrete, and 680 metric tons of mineral oil dielectric fluid.	6,157
TOTAL	**6,769**	**28,056**	**874**	**39,386**		**75,084**

† Scrap metal, precious metal, and aluminum can quantities are added together in the "metals" column.

†† Other materials may also include: plastic, styrofoam, glass, toner cartridges, food/garden waste, concrete, wood, fluorescent light tubes, coolant, filters, solvents, photographic materials, ground circuit boards, chemicals, small animal exposure tubes, paint adhesives, brick, non-process wastewater, furniture/office equipment, engine coolant, and fly ash.

††† Quantities are estimates that have been rounded to the nearest whole number, assuming that one cubic meter is equivalent to one metric ton. Materials sent offsite for handling to be recycled by another party are not included in these estimates.

§ Excludes 40,876 metric tons of recycled soil from the Lawrence Livermore National Laboratory used as landfill cover.

§§ Includes non-automotive batteries.

Albuquerque Operations Office Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **66**

Total Waste Reduced: **8,991 cubic meters**

Reported Cost Savings/Avoidance: **$4.6 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	63% reduction	50%
Mixed Waste	84% reduction	50%
Hazardous Waste	85% reduction	50%
Sanitary Waste	56% reduction	33%
Recycling	35% recycled	33%
Affirmative Procurement	76% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.4 1999 Albuquerque Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

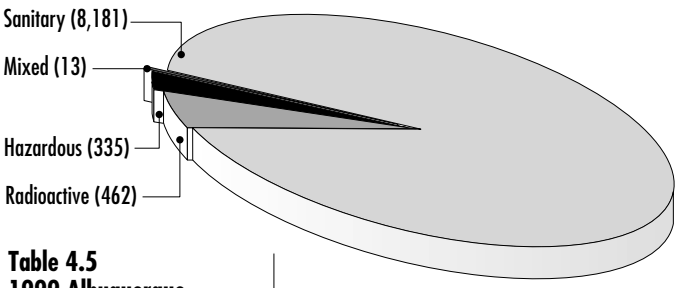


Table 4.5 1999 Albuquerque Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Grand Junction Projects Office; Grand Junction, CO	5	62	$3
Kansas City Plant; Kansas City, MO	2	10	$4
Los Alamos National Laboratory; Los Alamos, NM	24	2,459	$3,321
Pantex Plant; Amarillo, TX	15	355	$1,089
Sandia National Laboratories/California; Albuquerque, NM	2	8	$16
Sandia National Laboratories/New Mexico; Albuquerque, NM	4	5,899	$129
Waste Isolation Pilot Plant; Carlsbad, NM	14	198	$5

4.3 Albuquerque Operations Office

The Albuquerque Operations Office provides field level federal management to assure effective, efficient, safe, and secure accomplishment of DOE's national defense, environmental quality, science and technology, technology transfer and commercialization, and national energy objectives.

4.3.1 Pollution Prevention Performance

In 1999, approximately 9,000 cubic meters of waste were reduced at the Albuquerque Operations Office's seven reporting sites through implementation of pollution prevention projects (Figure 4.4). As a result, the Albuquerque Operations Office reduced the cost of operations by approximately $4.6 million.

4.3.2 Pollution Prevention Accomplishments

The Albuquerque Operations Office reported 66 pollution prevention projects in 1999, accounting for approximately four percent of the waste reduction within the DOE Complex (Table 4.5). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.5 compares waste reduction by pollution prevention activity category, and Figure 4.6 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- A variety of projects were implemented at the **Los Alamos National Laboratory** to decontaminate waste metal. These segregation activities reduced cleanup/stabilization low-level radioactive and low-level mixed wastes by 116 cubic meters, for a reported cost savings/avoidance of approximately $1.7 million.

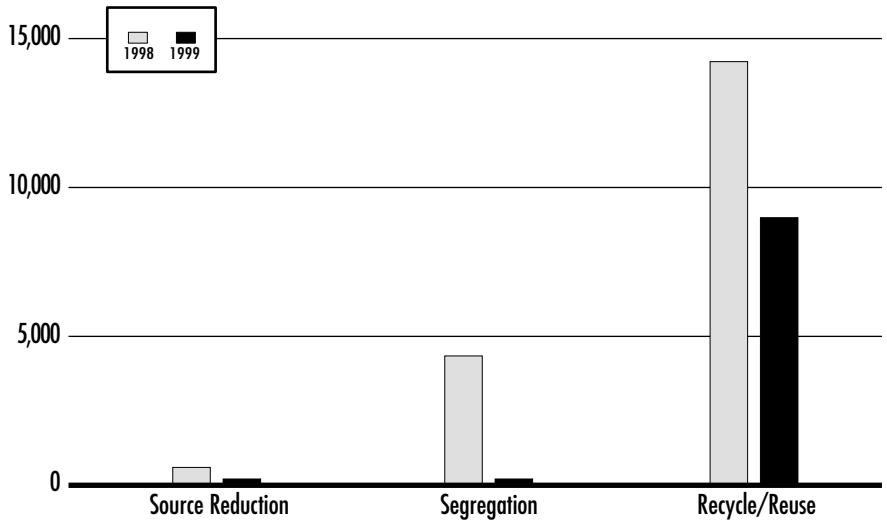


Figure 4.5
1998-1999
Albuquerque Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

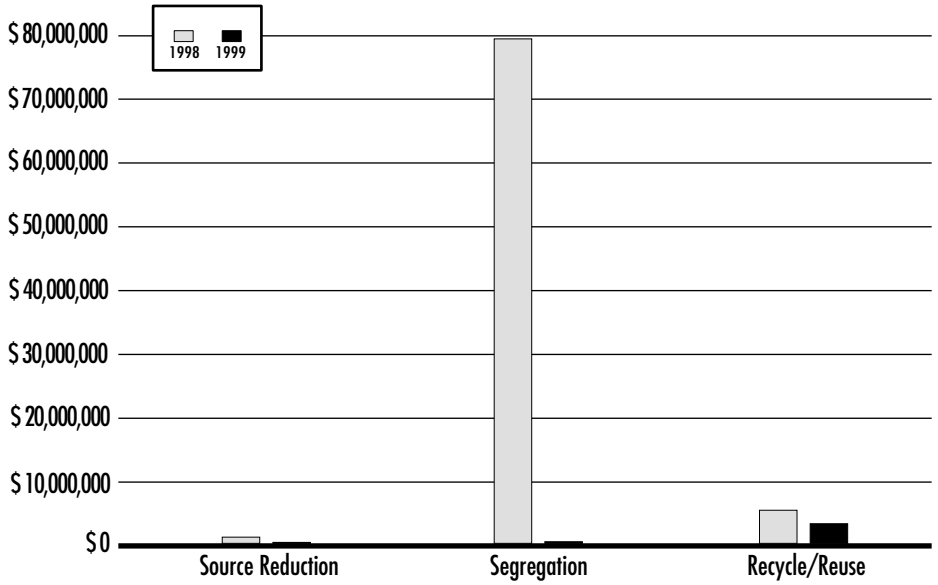


Figure 4.6
1998-1999
Albuquerque Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

- Hazardous nickel-cadmium and lead-acid batteries were recycled at the **Pantex Plant** instead of being disposed. This recycle/reuse activity reduced routine operations hazardous waste by approximately 50 metric tons, for a reported cost savings/avoidance of $488,655.

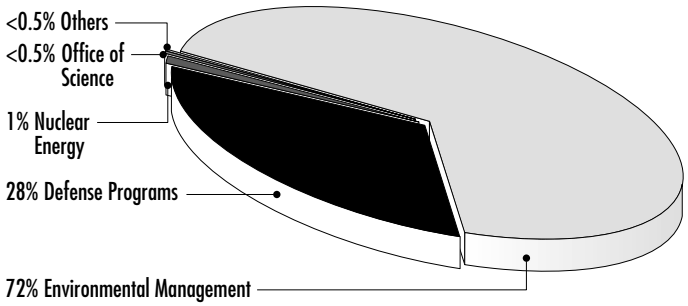
- At the **Los Alamos National Laboratory**, waste was characterized through the use of improved Nondestructive Assay (NDA) instrumentation, which enabled the measurement and characterization of waste as either transuranic or low-level radioactive. This improved technology allowed for more accurate measurements, and reduced the quantity of waste that had conservatively been classified as transuranic in the past. This segregation activity reduced cleanup/stabilization transuranic waste by approximately three cubic meters, for a reported cost savings/avoidance of $166,500.

- A 1998 Return-on-Investment project (Concrete Crusher) at the **Sandia National Laboratories/New Mexico** successfully crushed concrete and asphalt material for reuse at the Laboratory, eliminating the need to purchase new materials. This recycle/reuse activity reduced cleanup/stabilization sanitary waste by 5,895 metric tons, for a reported cost savings/avoidance of $75,000.

4.3.3 Waste Generation

The total waste generated by Albuquerque Operations Office reporting sites was approximately 46,400 cubic meters in 1999, accounting for approximately five percent of DOE's overall waste generation. Waste generated by the Albuquerque Operations Office in 1999 is primarily attributed to Environmental Management and Defense Programs (Figure 4.7).

Figure 4.7 1999 Albuquerque Operations Office Waste Generation by Program Secretarial Office



In 1999, Albuquerque Operations Office sites generated the most hazardous waste (16,400 metric tons, 71 percent) and sanitary waste (27,500 metric tons, 24 percent) within the DOE Complex (Figure 4.8). Virtually all of the hazardous waste was generated by the Los Alamos National Laboratory due to cleanup/stabilization activities.

Most of the sanitary waste was generated by Sandia National Laboratories/New Mexico and the Los Alamos National Laboratory due to cleanup/stabilization activities.

Routine operations transuranic, low-level radioactive, and low-level mixed waste generation by Albuquerque Operations Office sites increased 23 percent (from 99 to 122 cubic meters), 25 percent (from 674 to 842 cubic meters), and 10 percent (from eight to nine cubic meters), respectively, from 1998 to 1999. The increase in transuranic waste generation is due to the Los Alamos National Laboratory's preparation to produce pits and related research for the Stockpile Management Program. The increase in low-level radioactive waste generation is due to the Los Alamos National Laboratory's routine cleanout of contaminated wood pallets from waste storage. The increase in low-level mixed waste generation is primarily due to the Los Alamos National Laboratory's routine cleanout of contaminated electronic equipment and lead debris.

Cleanup/stabilization transuranic, hazardous, and sanitary waste generation by Albuquerque Operations Office sites increased 160 percent (from 42 to 110 cubic meters), 246 percent (from 4,632 to 16,036 metric tons), and 42 percent (from 12,571 to 17,853 metric tons), respectively, from 1998 to 1999. The increase in transuranic waste generation is primarily due to heightened activities of the Stockpile Management Program and cleanup of nuclear material storage vaults at the Los Alamos National Laboratory. The increase in hazardous waste generation is primarily due to the Los Alamos National Laboratory's cleanup activities, including projects that disposed of large quantities of asphalt and State regulated contaminated soils. The increase in sanitary waste generation is primarily due to a significant increase in construction work at the

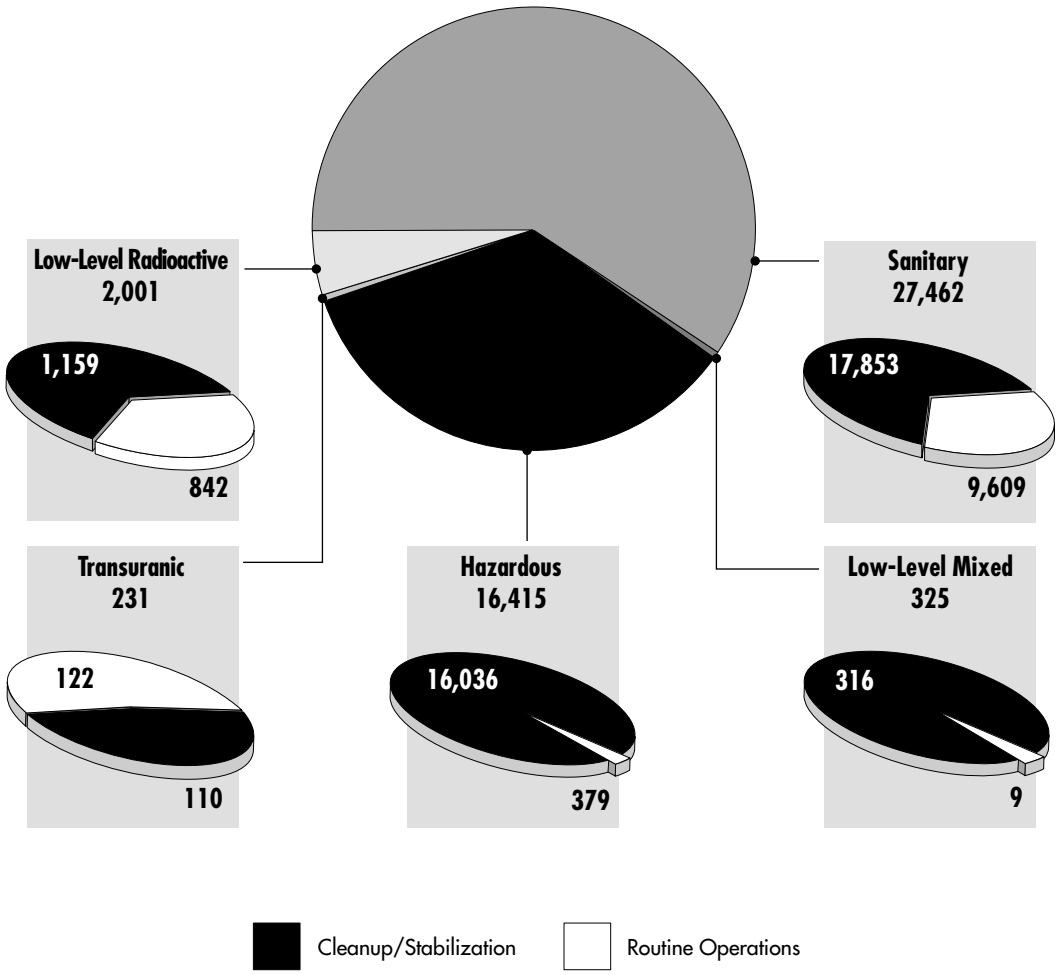


Figure 4.8
1999 Albuquerque Operations Office Waste Generation by Waste Type (in Cubic Meters)

Los Alamos National Laboratory, and an increase in construction, deconstruction, and road and sewer repair activities at Sandia National Laboratories/New Mexico.

Chicago Operations Office Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **78**

Total Waste Reduced: **5,992 cubic meters**

Reported Cost Savings/Avoidance: **$62.5 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	47% reduction	50%
Mixed Waste	96% reduction	50%
Hazardous Waste	96% reduction	50%
Sanitary Waste	60% reduction	33%
Recycling	66% recycled	33%
Affirmative Procurement	93% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.9 1999 Chicago Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

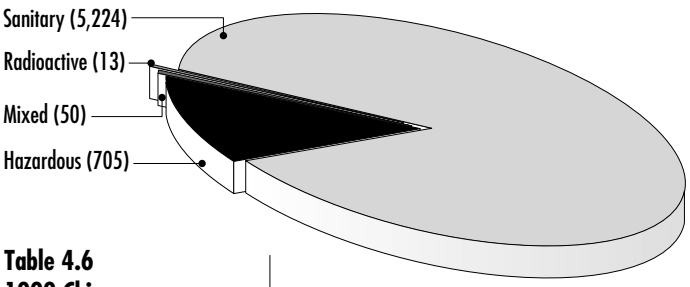


Table 4.6 1999 Chicago Operations Office Pollution Prevention Accomplishments by Site*

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Argonne National Laboratory – East; Argonne, IL	17	4,828	$429
Argonne National Laboratory – West; Idaho Falls, ID	30	232	$109
Brookhaven National Laboratory; Upton, NY	4	17	$39
Fermi National Accelerator Laboratory; Batavia, IL	4	184	$39
Princeton Plasma Physics Laboratory; Princeton, NJ	23	730	$61,888

* Sites that did not report pollution prevention projects in 1999 are not included in this table.

4.4 Chicago Operations Office

The Chicago Operations Office is responsible for energy research, development, and construction, including the administration of operating contracts for five of the nation's major government-owned laboratories.

4.4.1 Pollution Prevention Performance

In 1999, approximately 6,000 cubic meters of waste were reduced at five of the Chicago Operations Office's reporting sites through implementation of pollution prevention projects (Figure 4.9). As a result, the Chicago Operations Office reduced the cost of operations by approximately $62.5 million.

4.4.2 Pollution Prevention Accomplishments

The Chicago Operations Office reported 78 pollution prevention projects in 1999, accounting for three percent of the waste reduction within the DOE Complex (Table 4.6). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.10 compares waste reduction by pollution prevention activity category, and Figure 4.11 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- The **Princeton Plasma Physics Laboratory** reused systems and equipment in the construction of the National Spherical Torus Experiment, an innovative magnetic fusion device. The systems and equipment reused included neutral beam, vacuum pump, Poloidal Magnetic Field and Ion Cyclotron Radio Frequency systems, and concrete modular shielding wall

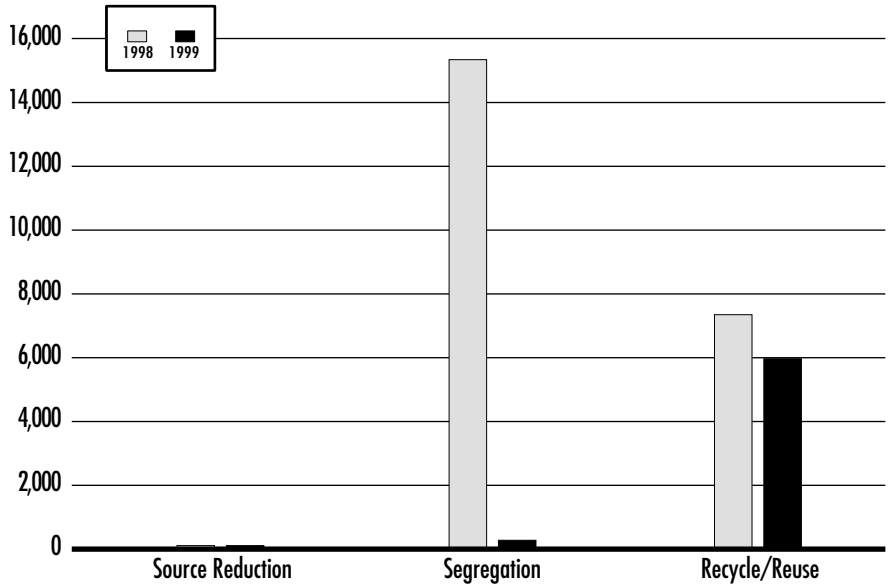


Figure 4.10 1998-1999 Chicago Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

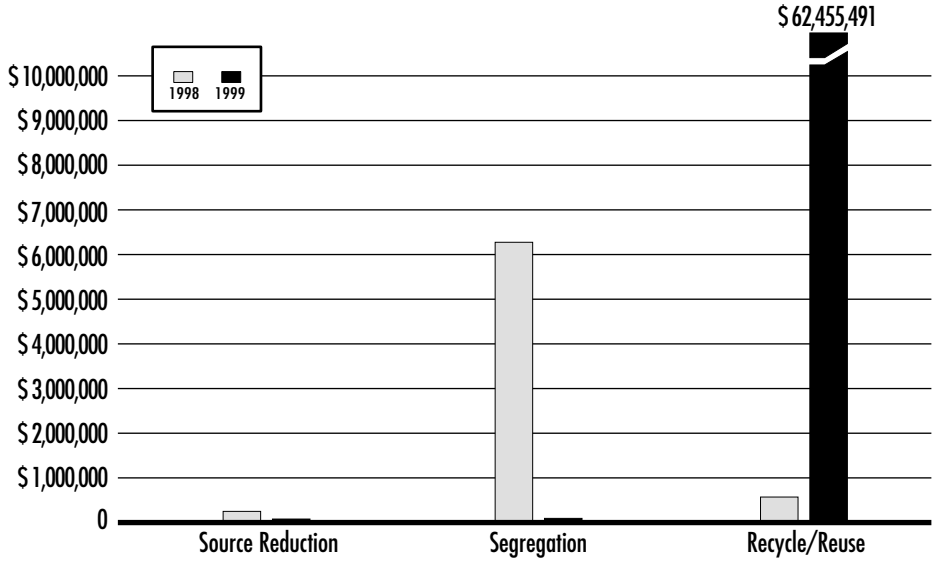


Figure 4.11 1998-1999 Chicago Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

equipment. This recycle/reuse activity reduced routine operations low-level radioactive and sanitary wastes by approximately 332 metric tons, for a reported cost savings/avoidance of $61.5 million, the largest reported cost savings/avoidance in the DOE Complex in Calendar Year 1999.

- Retrieval of spent nuclear fuel from the **Argonne National Laboratory – West's** Radioactive Scrap and Waste Facility allowed the recovery of 30 shield plugs from the remote-handled containers. The shield plugs, which are lead encased in steel, are reused in remote-handled containers. This recycle/reuse activity reduced routine operations low-level mixed waste by approximately one cubic meter, for a reported cost savings/avoidance of $56,400.

- At the **Princeton Plasma Physics Laboratory**, a total of 212 tons of materials were recycled, including copper, stainless steel, and insulation compound. These materials were recovered from the Princeton Large Torus, the first large experimental machine constructed at the Laboratory, which was used for plasma experiments. This recycle/reuse activity reduced routine operations sanitary waste by 192 metric tons, for a reported cost savings/avoidance of $51,500.

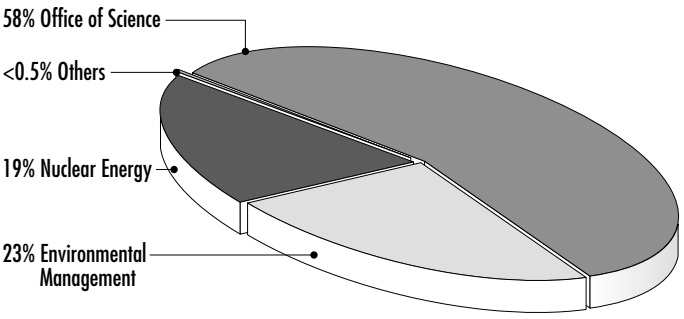
- Rare earth metals were shipped from the **Argonne National Laboratory – East** to DOE's Ames Laboratory-Iowa State University for reuse after being advertised as surplus chemicals on the Chemical Bulletin Board. This recycle/reuse activity reduced routine operations hazardous waste by approximately one metric ton, for a reported cost savings/avoidance of $42,000.

- Approximately 1,800 gallons of paint (consisting of old stock, unwanted colors, etc.) from the **Brookhaven National Laboratory** was offered to nonprofit organizations in surrounding communities for reuse. This recycle/reuse activity reduced routine operations hazardous waste by approximately 13 metric tons, for a reported cost savings/avoidance of $12,000.

4.4.3 Waste Generation

The total waste generated by Chicago Operations Office reporting sites was approximately 7,200 cubic meters in 1999, accounting for approximately one percent of DOE's overall waste generation. Waste generated by the Chicago Operations Office in 1999 is primarily attributed to the Office of Science (Figure 4.12).

Figure 4.12 1999 Chicago Operations Office Waste Generation by Program Secretarial Office



In 1999, sanitary waste generation of 4,000 metric tons accounted for 55 percent of all waste generated by Chicago Operations Office sites (Figure 4.13). Approximately half of this waste was generated by the Argonne National Laboratory – East, mainly due to cleanup/stabilization activities.

Routine operations transuranic waste generation by Chicago Operations Office sites increased (from zero to one cubic meter) from 1998 to 1999. This increase is due to normal fluctuations in the operations of the Argonne National Laboratory – West.

Cleanup/stabilization low-level mixed and sanitary waste generation by Chicago Operations Office sites increased 4,990 percent (from five to 236 cubic meters), and 49 percent (from 1,045 to 1,651 metric tons), respectively, from 1998 to 1999. The increase in low-level mixed waste generation is primarily due to the remediation of mercury-contaminated soil at the Brookhaven National Laboratory. The increase in sanitary waste is due to an increase in construction and demolition activities at the Argonne National Laboratory – East.

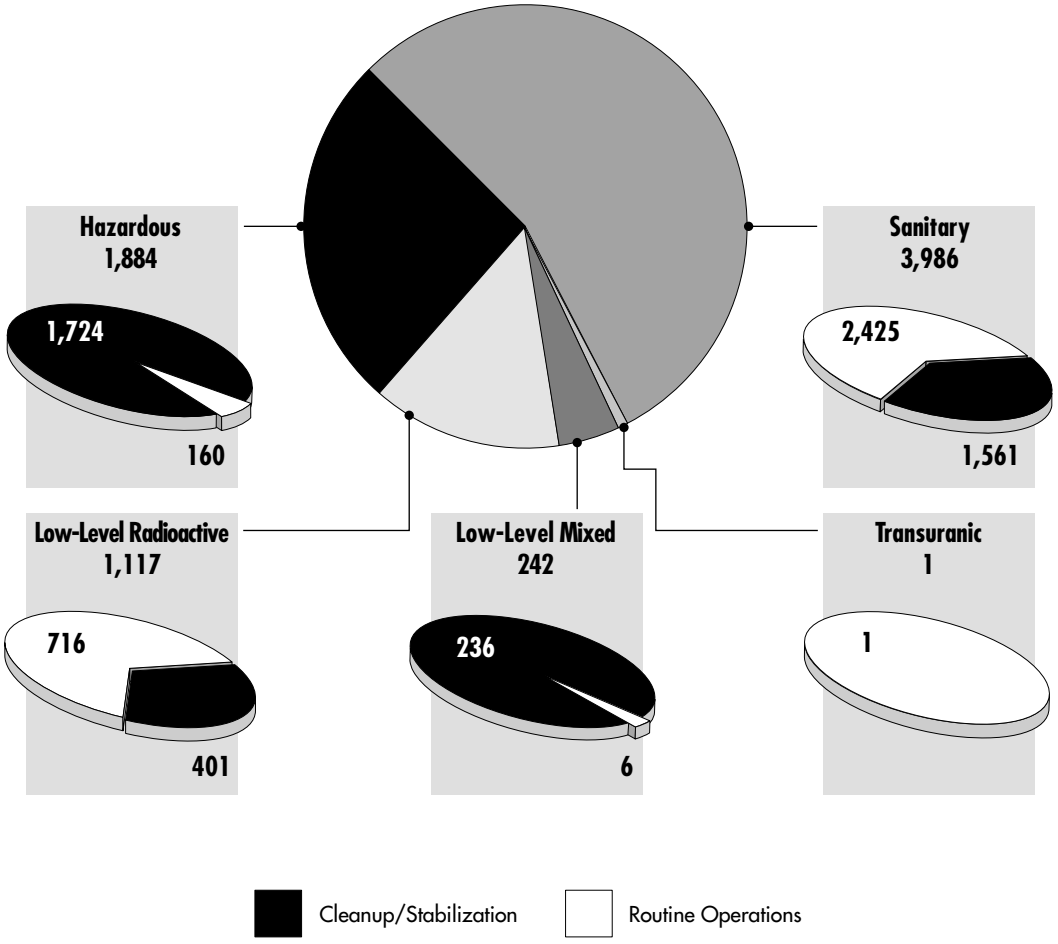


Figure 4.13
1999 Chicago Operations Office Waste Generation by Waste Type (in Cubic Meters)

Idaho Operations Office
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects:	**23**
Total Waste Reduced:	**8,501 cubic meters**
Reported Cost Savings/Avoidance:	**$26.9 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	51% reduction	50%
Mixed Waste	47% increase**	50%
Hazardous Waste	95% reduction	50%
Sanitary Waste	83% reduction	33%
Recycling	26% recycled	33%
Affirmative Procurement	100% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

** 1993 baseline was 27 cubic meters due to a moratorium on mixed waste generation.

Figure 4.14
1999 Idaho Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

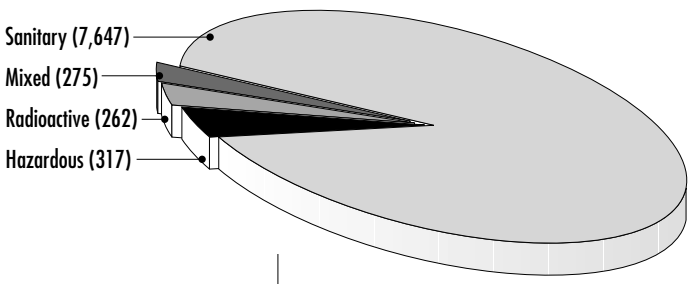


Table 4.7
1999 Idaho Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Idaho National Engineering and Environmental Laboratory; Idaho Falls, ID	23	8,501	$26,929

4.5 Idaho Operations Office

The Idaho Operations Office is responsible for the administration and management of assigned programs; alternate energy technology development and demonstration projects; chemical processing operations and demonstration; environmental restoration and waste management operations; and nuclear reactor safety research, development, and demonstration.

4.5.1 Pollution Prevention Performance

In 1999, approximately 8,500 cubic meters of waste were reduced at the Idaho Operations Office's one reporting site through implementation of pollution prevention projects (Figure 4.14). As a result, the Idaho Operations Office reduced the cost of operations by approximately $26.9 million.

4.5.2 Pollution Prevention Accomplishments

The Idaho Operations Office reported 23 pollution prevention projects in 1999, accounting for approximately four percent of the waste reduction within the DOE Complex (Table 4.7). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.15 compares waste reduction by pollution prevention activity category, and Figure 4.16 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- The Environmental Restoration organization at the **Idaho National Engineering and Environmental Laboratory** deactivated and decommissioned buildings and equipment, and reused or recycled the

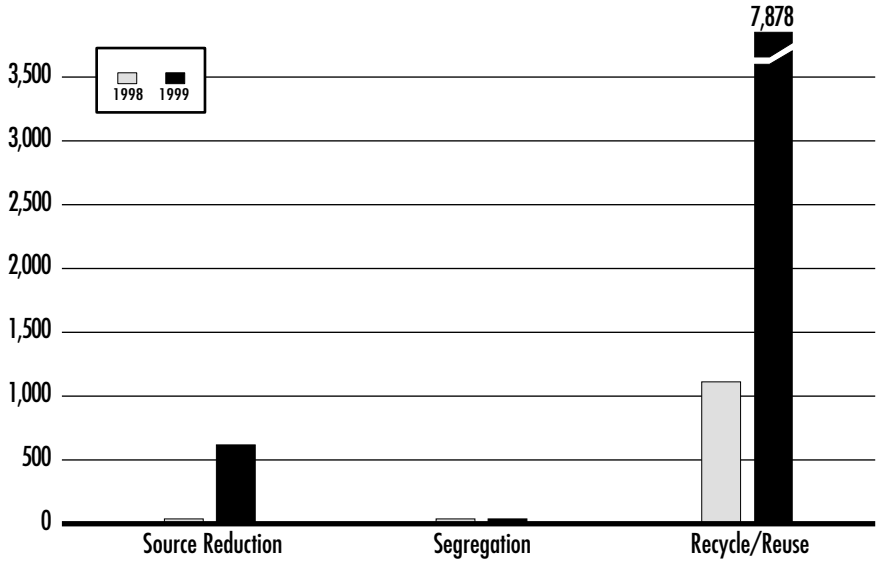


Figure 4.15 1998-1999 Idaho Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

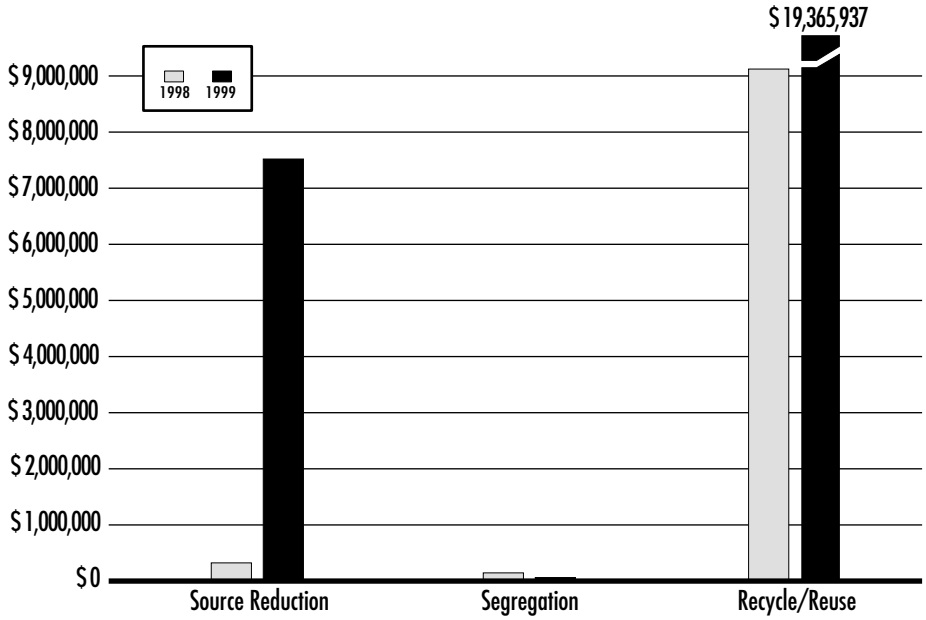


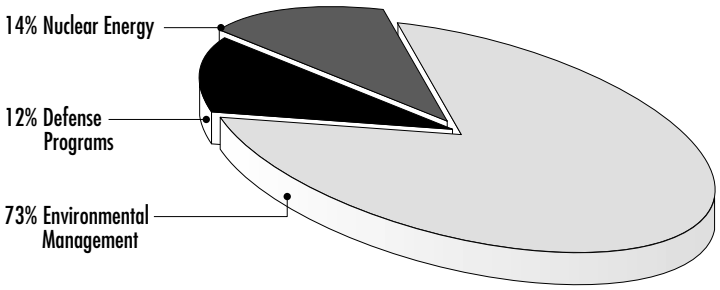
Figure 4.16 1998-1999 Idaho Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

resulting concrete, steel, wood materials, etc. This recycle/reuse activity reduced cleanup/stabilization sanitary waste by approximately 6,467 metric tons, for a reported cost savings/avoidance of approximately $11 million.

- The total volume of office paper used at the **Idaho National Engineering and Environmental Laboratory** has been reduced 50 percent due to the use of electronic documents, electronic drawings, and E-mail. This source reduction activity reduced routine operations sanitary waste by 148 metric tons, for a reported cost savings/avoidance of $4.1 million (including $252,000 in avoided waste handling costs, and $3.8 million in material cost savings, as calculated in the Pollution Prevention Opportunity Assessment [PPOA] recommendation).

4.5.3 Waste Generation

Figure 4.17 1999 Idaho Operations Office Waste Generation by Program Secretarial Office



The total waste generated by the Idaho Operations Office's one reporting site was approximately 28,000 cubic meters in 1999, accounting for approximately three percent of DOE's overall waste generation. Waste generated by the Idaho Operations Office in 1999 is primarily attributed to Environmental Management (Figure 4.17).

In 1999, sanitary waste generation of 25,300 metric tons accounted for 90 percent of all waste generated by the Idaho National Engineering and Environmental Laboratory (INEEL; Figure 4.18). Most of this waste was generated by cleanup/stabilization activities.

Routine operations low-level radioactive and hazardous waste generation by INEEL increased by 20 percent (from 1,243 to 1,493 cubic meters) and 43 percent (from 21 to 30 metric tons), respectively, from 1998 to 1999. The increase in low-level radioactive waste was due to due to the sorting and removal of low-level radioactive waste stockpiled from previous years at the Specific Manufacturing Capability Facility and the Test Reactor Area. The increase in hazardous waste generation (primarily Resource Conservation and Recovery Act [RCRA] regulated waste) is due to packing activities at the Test Reactor Area, Idaho Nuclear Technology and Engineering Center, and the INEEL Research Center, as a result of efforts to reduce inventories of unneeded chemicals and materials.

Cleanup/stabilization hazardous waste generation by INEEL increased 210 percent (from 20 to 62 metric tons), from 1998 to 1999. Cleanup/stabilization sanitary waste generation increased 467 percent (from 4,271 to 24,200 metric tons). The increase in hazardous waste generation is due to Test Reactor Area deactivation of several chemical storage tanks in the old water demineralizer plant area, and refurbishing of a water storage tank. The sanitary waste increase is due to deactivation and decommissioning activities which resulted in the disposal of concrete, asphalt, and uncontaminated building debris at the landfill.

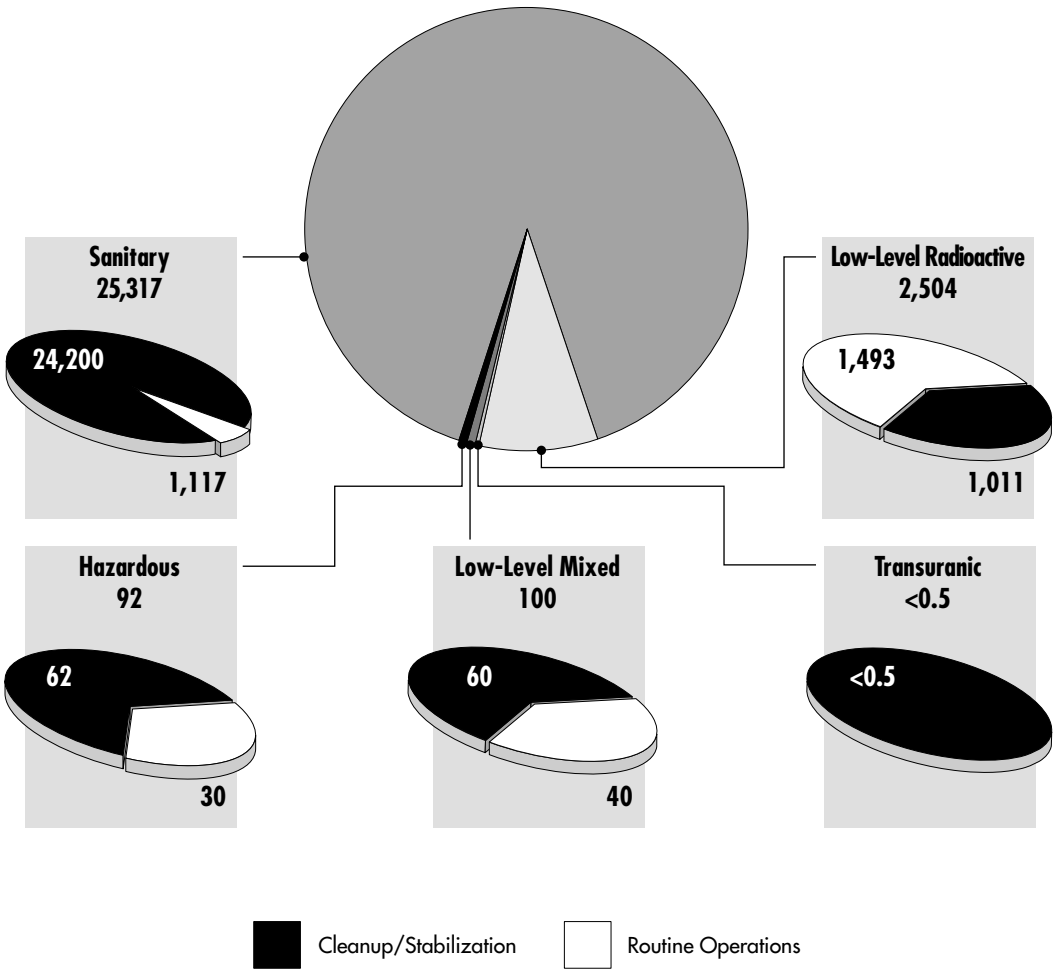


Figure 4.18
1999 Idaho Operations Office Waste Generation by Waste Type (in Cubic Meters)

Nevada Operations Office
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **21**

Total Waste Reduced: **1,223 cubic meters**

Reported Cost Savings/Avoidance: **$100,540**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	seven cubic meter increase**	50%
Hazardous Waste	99.5% reduction	50%
Sanitary Waste	46% reduction	33%
Recycling	9% recycled	33%
Affirmative Procurement	100% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

** 1993 baseline is zero.

Figure 4.19
1999 Nevada Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

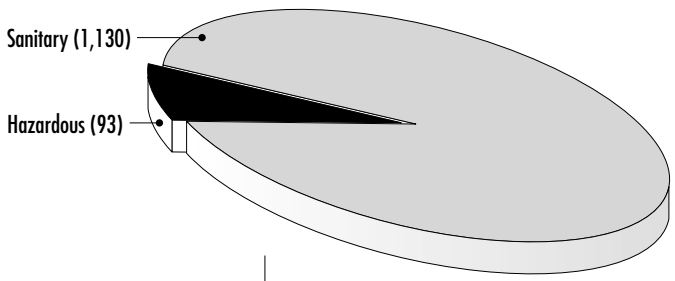


Table 4.8
1999 Nevada Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Nevada Test Site; Mercury, NV	21	1,223	$101

4.6 Nevada Operations Office

The Nevada Operations Office is responsible for stewardship of the Nevada Test Site, and provides support for national security, energy efficiency and renewable energy, environmental management, and technology diversification.

4.6.1 Pollution Prevention Performance

In 1999, approximately 1,200 cubic meters of waste were reduced at the Nevada Operations Office's one reporting site through implementation of pollution prevention projects (Figure 4.19). As a result, the Nevada Operations Office reduced the cost of operations by $100,540.

4.6.2 Pollution Prevention Accomplishments

The Nevada Operations Office reported 21 pollution prevention projects in 1999, accounting for approximately one percent of the waste reduction within the DOE Complex (Table 4.8). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.20 compares waste reduction by pollution prevention activity category, and Figure 4.21 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Unneeded copier machine supplies were collected at the **Nevada Test Site**, and approximately 50 percent were redistributed within the Nevada Operations Office and the Nevada Environmental Protection Agency. The remaining unneeded supplies were returned to the vendor for credit. This recycle/reuse activity reduced routine

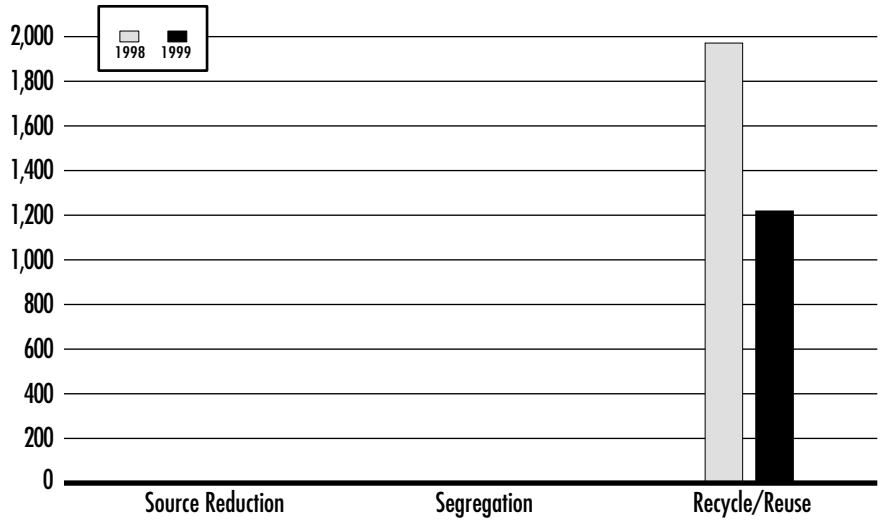


Figure 4.20 1998-1999 Nevada Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

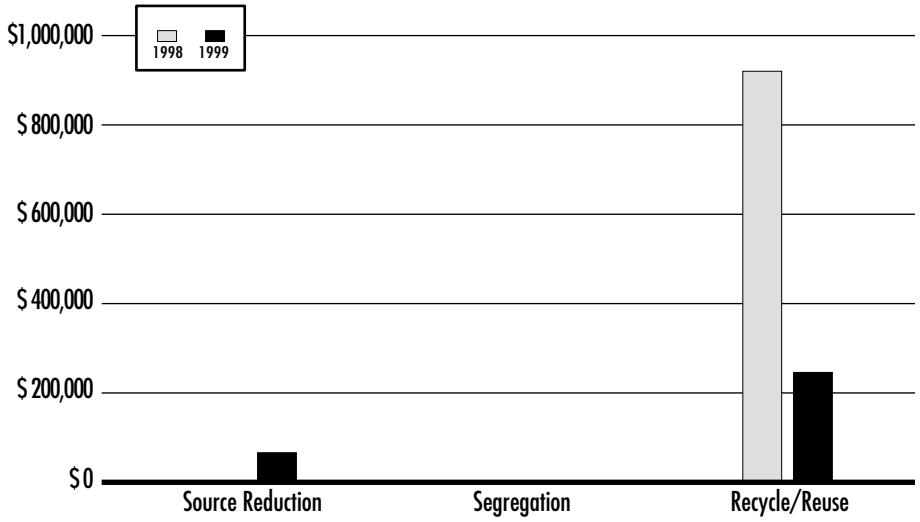


Figure 4.21 1998-1999 Nevada Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

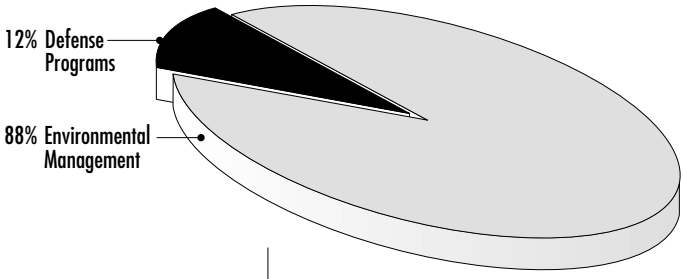
operations sanitary waste by less than one metric ton, for a reported cost savings/avoidance of $32,000.

- At the **Nevada Test Site**, ferrous, nonferrous, and light steel scrap metals were sold for recycling. This recycle/reuse activity reduced cleanup/stabilization sanitary waste by approximately 716 metric tons, for a reported cost savings/avoidance of $20,379.

4.6.3 Waste Generation

The total waste generated by the Nevada Operations Office's one reporting site was approximately 13,500 cubic meters in 1999, accounting for approximately one percent of DOE's overall waste generation. Waste generated by the Nevada Operations Office in 1999 is primarily attributed to Environmental Management (Figure 4.22).

Figure 4.22 1999 Nevada Operations Office Waste Generation by Program Secretarial Office



In 1999, sanitary waste generation of 12,600 metric tons accounted for 94 percent of all waste generated by the Nevada Operations Office (Figure 4.23). More than half of this waste was generated due to routine operations activities.

Routine operations low-level radioactive waste generation by the Nevada Operation Office increased from zero to seven cubic meters from 1998 to 1999. There was a slight increase in sanitary waste generation from 1998 to 1999. The increase in low-level radioactive waste was essentially due to disposal of radiological materials from various generators at the Nevada Test Site.

Cleanup/stabilization low-level radioactive and sanitary waste generation by the Nevada Operations Office increased 42 percent (from 548 to 776 cubic meters) and 213 percent (from 1,647 to 5,157 metric tons), respectively, from 1998 to 1999. The increase in low-level radioactive waste was due to variations in waste volumes resulting from funding and schedule constraints. The increase in sanitary waste was due to a large volume of soil from Corrective Action Units (CAUs) 340 and 342 that was disposed at the Nevada Test Site landfill.

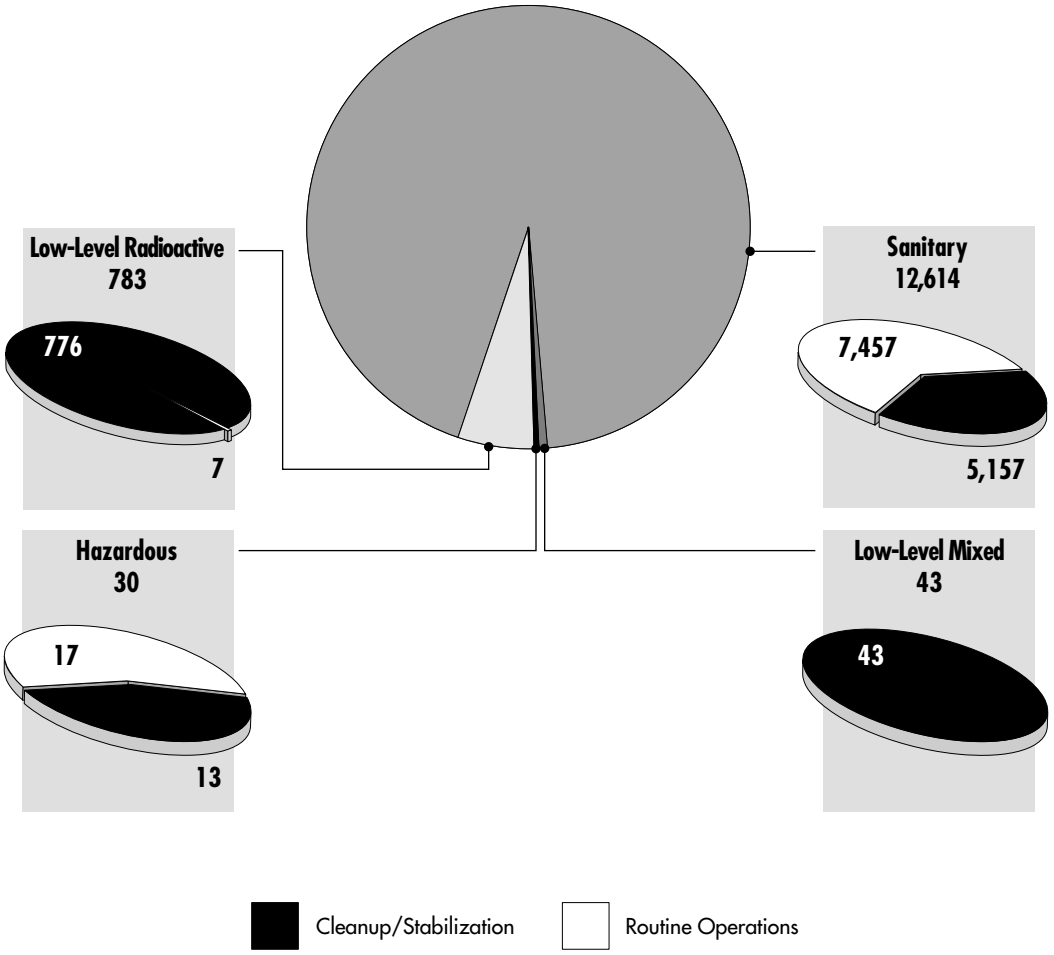


Figure 4.23
1999 Nevada Operations Office Waste Generation by Waste Type (in Cubic Meters)

Oakland Operations Office Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **22**

Total Waste Reduced: **2,523 cubic meters**

Reported Cost Savings/Avoidance: **$2.7 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	3% reduction	50%
Mixed Waste	68% reduction	50%
Hazardous Waste	72% reduction	50%
Sanitary Waste	71% reduction	33%
Recycling	62% recycled	33%
Affirmative Procurement	86% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.24 1999 Oakland Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

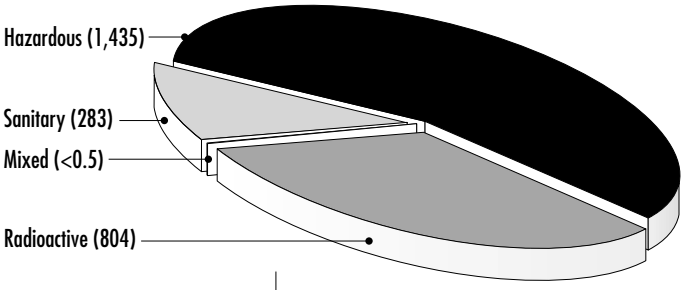


Table 4.9 1999 Oakland Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Energy Technology Engineering Center; Canoga Park, CA	7	905	$725
Lawrence Berkeley National Laboratory; Berkeley, CA	10	402	$1,574
Lawrence Livermore National Laboratory; Livermore, CA	4	1,163	$334
Stanford Linear Accelerator Center; Stanford, CA	1	52	$60

4.7 Oakland Operations Office

The Oakland Operations Office serves the public by managing world-class national research and development facilities, including the administration of operating contracts for several government-owned laboratories and facilities.

4.7.1 Pollution Prevention Performance

In 1999, approximately 2,500 cubic meters of waste were reduced at four of the Oakland Operations Office's reporting sites through implementation of pollution prevention projects (Figure 4.24). As a result, the Oakland Operations Office reduced the cost of operations by approximately $2.7 million.

4.7.2 Pollution Prevention Accomplishments

The Oakland Operations Office reported 22 pollution prevention projects in 1999, accounting for approximately one percent of the waste reduction within the DOE Complex (Table 4.9). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.25 compares waste reduction by pollution prevention activity category, and Figure 4.26 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Slightly radioactive ("lightly-activated") concrete shielding blocks at the **Lawrence Berkeley National Laboratory** were shipped to the Brookhaven National Laboratory for reuse in their Relativistic Heavy Ion Collider. This recycle/reuse activity reduced routine operations low-level radioactive waste by 399 cubic meters, for a reported cost savings/avoidance of $1.4 million.

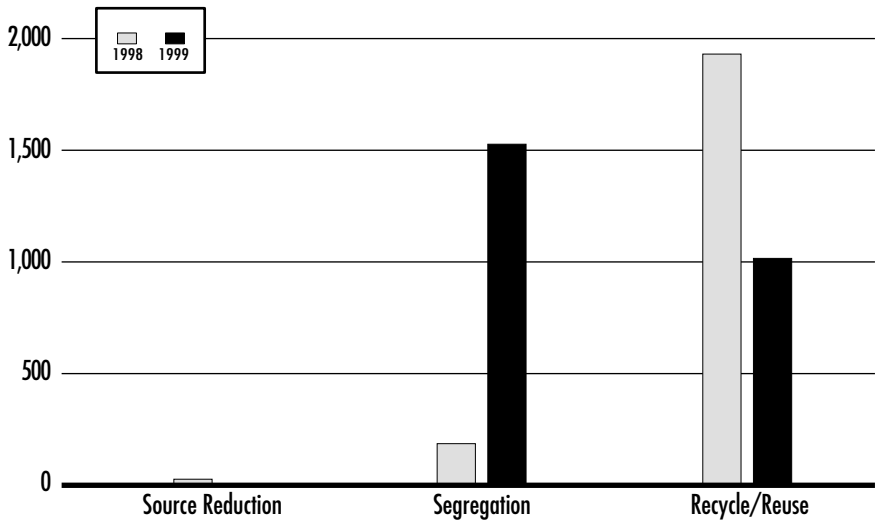


Figure 4.25 1998-1999 Oakland Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

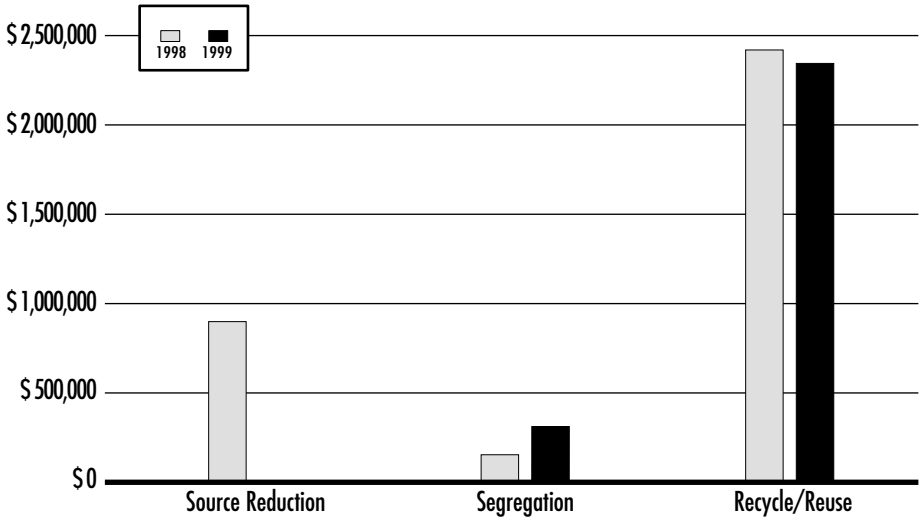


Figure 4.26 1998-1999 Oakland Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

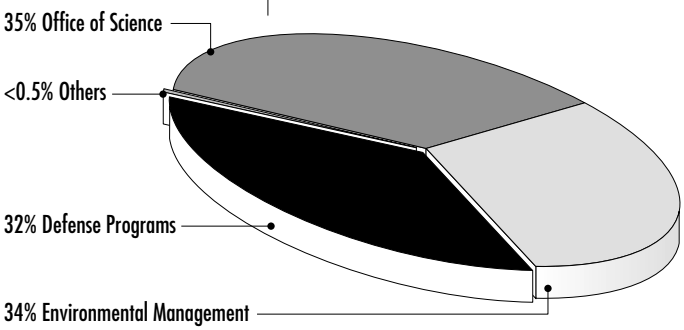
- At the **Energy Technology Engineering Center**, approximately 10,200 pounds of sodium (a hazardous chemical because of its reactivity) were converted into nonhazardous sodium hydroxide using a water vapor and nitrogen process. This recycle/reuse activity reduced cleanup/stabilization hazardous waste by approximately five metric tons, for a reported cost savings/avoidance of $370,000.

- Approximately 7,000 gallons of 94 percent ethanol were transported by a commercial vendor (at the vendor's expense) from the **Lawrence Livermore National Laboratory** for processing into fuel and industrial grade ethanol. The ethanol, previously used as laser dye solvent in the Atomic Vapor Laser Isotope Separation (AVLIS) program, became available when the program was discontinued. This recycle/reuse activity reduced routine operations hazardous waste by approximately 27 metric tons, for a reported cost savings/avoidance of $70,000.

4.7.3 Waste Generation

The total waste generated by Oakland Operations Office reporting sites was approximately 12,000 cubic meters in 1999, accounting for one percent of DOE's overall waste generation total. Waste generation by the Oakland Operations Office in 1999 is primarily attributed to the Office of Science, Environmental Management, and Defense Programs (Figure 4.27).

Figure 4.27 1999 Oakland Operations Office Waste Generation by Program Secretarial Office



In 1999, sanitary waste generation of 6,100 metric tons accounted for 51 percent of all waste generated by Oakland Operations Office sites (Figure 4.28). Most of this waste was generated at the Lawrence Livermore National Laboratory due to routine operations and cleanup/stabilization activities.

Routine operations waste generation decreased for all types of waste from 1998 to 1999.

Cleanup/stabilization low-level mixed and hazardous waste generation by Oakland Operations Office sites increased 557 percent (from 14 to 92 cubic meters), and 172 percent (from 1,470 to 3,996 metric tons), respectively, from 1998 to 1999. The increase in low-level mixed waste generation is primarily due to cleanout activities at the Lawrence Livermore National Laboratory. The increase in hazardous waste generation is due to the Stanford Linear Accelerator Center's increased remediation of contaminated soils (including 2,100 metric tons of nonhazardous State regulated waste that is categorized as hazardous for the purpose of this Report); and the Lawrence Livermore National Laboratory's cleanup project at the East Traffic Circle to improve drainage, and the disposal of capacitors and transformers that were removed from service.

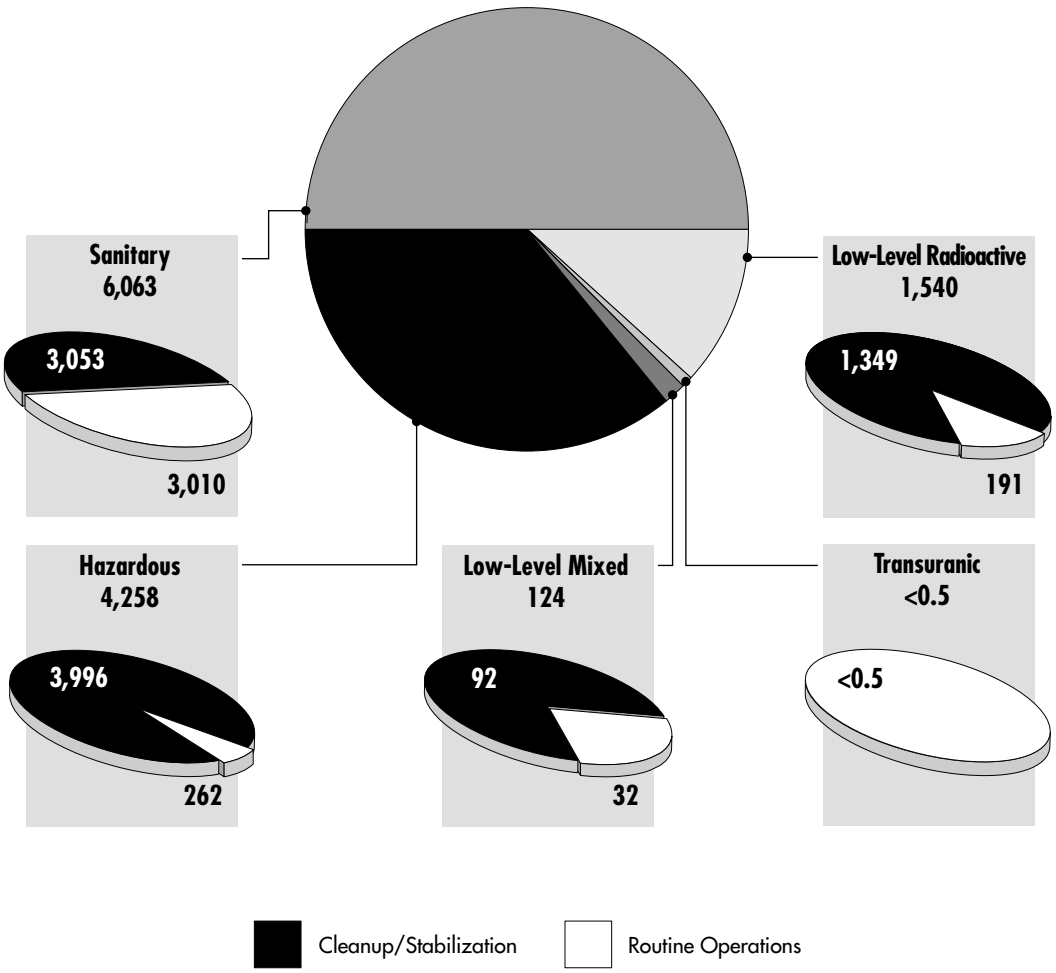


Figure 4.28
1999 Oakland Operations Office Waste Generation by Waste Type (in Cubic Meters)

Oak Ridge Operations Office Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **83**

Total Waste Reduced: **32,274 cubic meters**

Reported Cost Savings/Avoidance: **$5.1 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	78% reduction	50%
Mixed Waste	89% reduction	50%
Hazardous Waste	50% reduction	50%
Sanitary Waste	61% reduction	33%
Recycling	50% recycled	33%
Affirmative Procurement	75% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.29 1999 Oak Ridge Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

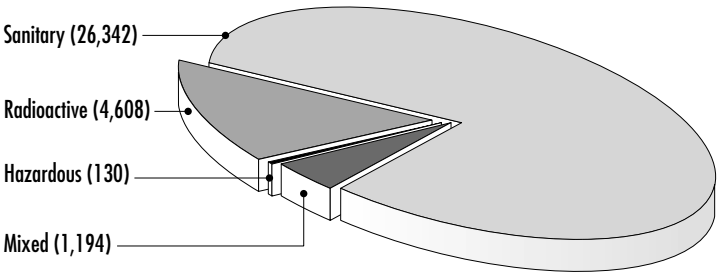


Table 4.10 1999 Oak Ridge Operations Office Pollution Prevention Accomplishments by Site*

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
East Tennessee Technology Park; Oak Ridge, TN	25	4,278	$2,150
Oak Ridge National Laboratory; Oak Ridge, TN	10	18,707	$541
Oak Ridge Y-12 Plant; Oak Ridge, TN	38	8,283	$2,360
Paducah Gaseous Diffusion Plant; Paducah, KY	2	4	$0
Portsmouth Gaseous Diffusion Plant; Piketon, OH	8	1,003	$0

* Sites that did not report pollution prevention projects in 1999 are not included in this table.

4.8 Oak Ridge Operations Office

The Oak Ridge Operations Office provides weapons component dismantlement, maintains the nation's inventory of enriched uranium and lithium, conducts a diversified research and development program on a variety of energy technologies, performs environmental management activities, oversees nuclear safety for enrichment facilities, and provides technical assistance training.

4.8.1 Pollution Prevention Performance

In 1999, approximately 32,300 cubic meters of waste were reduced at five of the Oak Ridge Operations Office's reporting sites through implementation of pollution prevention projects (Figure 4.29). As a result, the Oak Ridge Operations Office reduced the cost of operations by approximately $5.1 million.

4.8.2 Pollution Prevention Accomplishments

The Oak Ridge Operations Office reported 83 pollution prevention projects in 1999, accounting for approximately 15 percent of the waste reduction within the DOE Complex (Table 4.10). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.30 compares waste reduction by pollution prevention activity category, and Figure 4.31 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

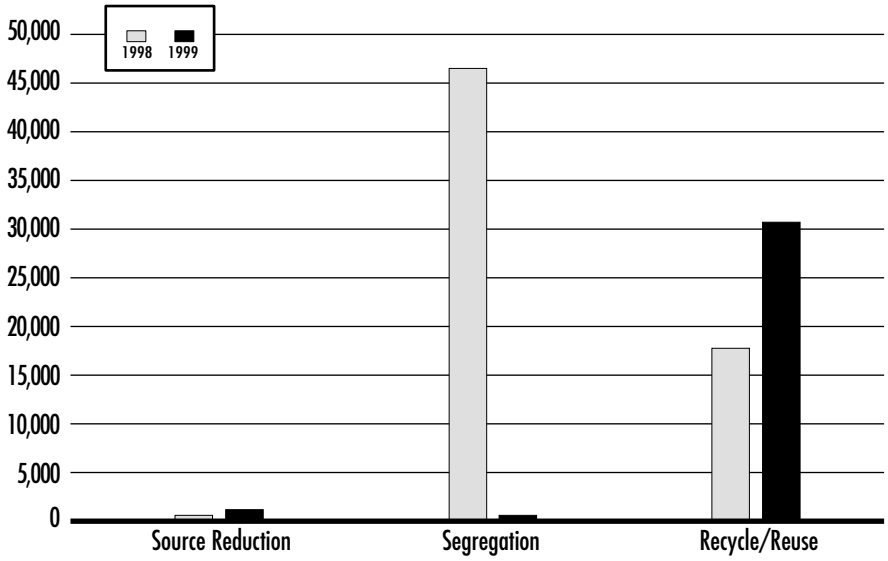


Figure 4.30 1998-1999 Oak Ridge Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

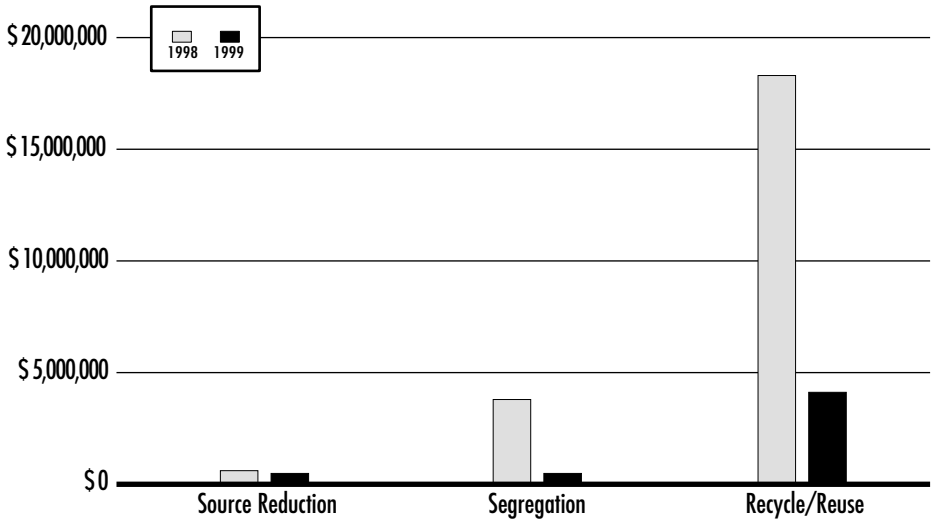


Figure 4.31 1998-1999 Oak Ridge Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

- At the **East Tennessee Technology Park**, lead-acid batteries were collected from emergency lighting fixtures and vehicles, and were sold to an offsite recycler. This recycle/reuse activity reduced routine operations low-level mixed waste by approximately 19 cubic meters, for a reported cost savings/avoidance of $815,802.

- The **Oak Ridge National Laboratory** continued to recycle industrial wastestreams such as scrap metal, used oil, lead-acid batteries, and coal ash for land re-contouring. This recycle/reuse activity reduced routine operations sanitary waste by approximately 15,683 metric tons, for a reported cost savings/avoidance of $200,000.

- An impermeable cap was installed over the Bear Creek Burial Grounds C-East blanket drain system at the **Oak Ridge Y-12 Plant** to reduce the contact of rainwater with contaminated soils, which resulted in less secondary waste generation at the

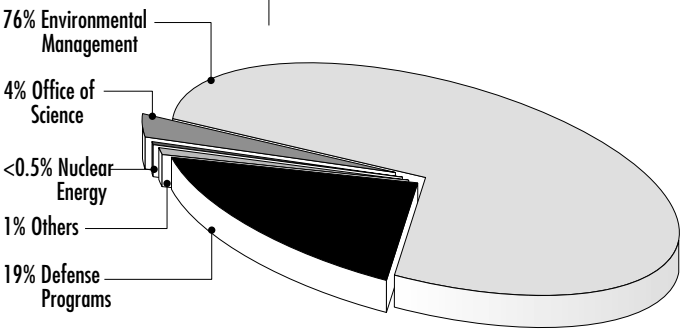
Liquid Storage and Groundwater Treatment facilities. This source reduction activity reduced cleanup/stabilization mixed TSCA waste by approximately 1,116 cubic meters, for a reported cost savings/avoidance of $145,000.

4.8.3 Waste Generation

The total waste generated by Oak Ridge Operations Office reporting sites was approximately 22,500 cubic meters in 1999, accounting for two percent of DOE's overall waste generation. Waste generated by the Oak Ridge Operations Office in 1999 is primarily attributed to Environmental Management and Defense Programs (Figure 4.32).

In 1999, Oak Ridge Operations Office sites generated the most low-level mixed waste (1,900 cubic meters, 47 percent) within the DOE Complex (Figure 4.33). Most of the low-level mixed waste was generated by the Oak Ridge Y-12 Plant and East Tennessee Technology Park due to cleanup/stabilization activities.

Figure 4.32 1999 Oak Ridge Operations Office Waste Generation by Program Secretarial Office



Routine operations sanitary waste generation by Oak Ridge Operations Office sites increased slightly from 1998 to 1999, and generation of all other waste types decreased.

Cleanup/stabilization low-level radioactive waste generation by the Oak Ridge Operations Office sites increased 27 percent (from 2,478 to 3,146 cubic meters) from 1998 to 1999. This increase is primarily due to the East Tennessee Technology Park's fluctuations in deactivation and decommissioning efforts associated with privatization and reindustrialization.

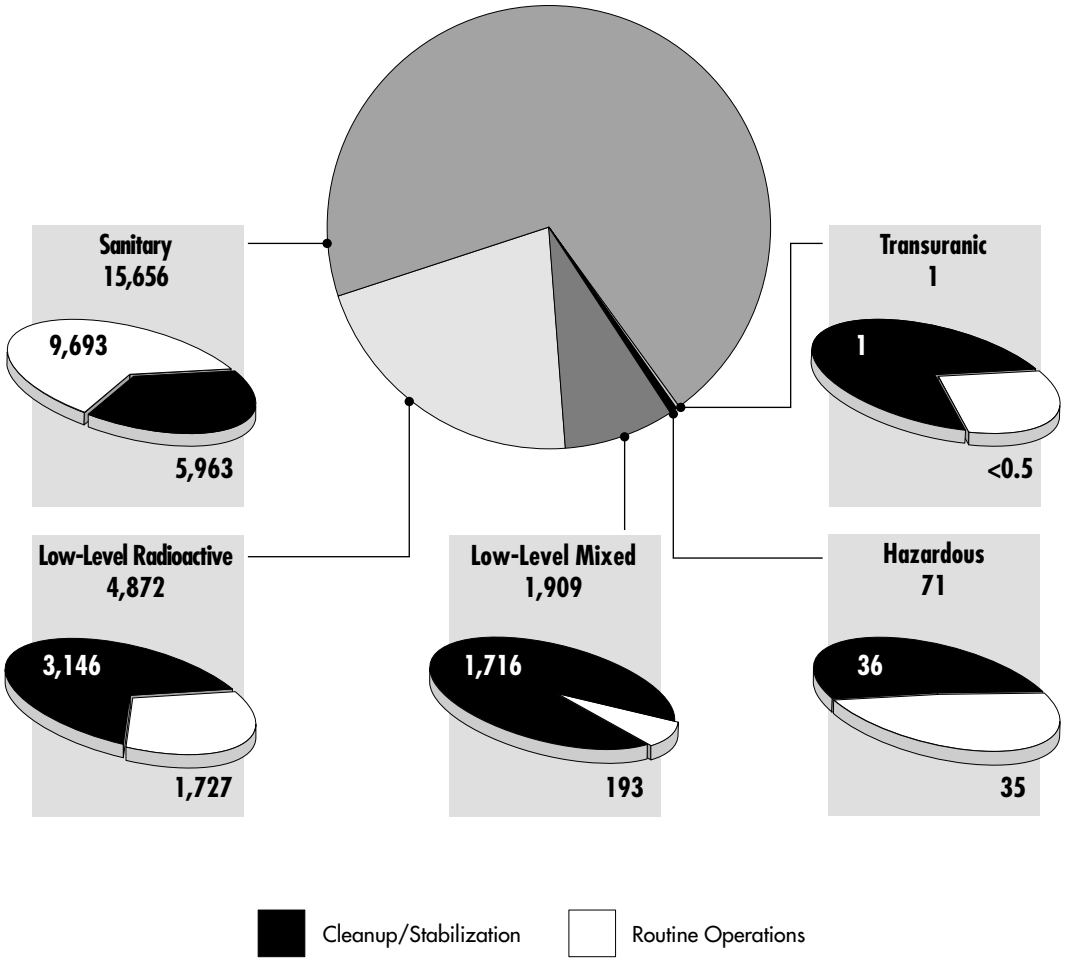


Figure 4.33
1999 Oak Ridge Operations Office Waste Generation by Waste Type (in Cubic Meters)

Ohio Field Office
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **59**
Total Waste Reduced: **9,132 cubic meters**
Reported Cost Savings/Avoidance: **$4.7 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	90% reduction	50%
Mixed Waste	71% reduction	50%
Hazardous Waste	93% reduction	50%
Sanitary Waste	91% increase	33%
Recycling	22% recycled	33%
Affirmative Procurement	100% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.34
1999 Ohio Field Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

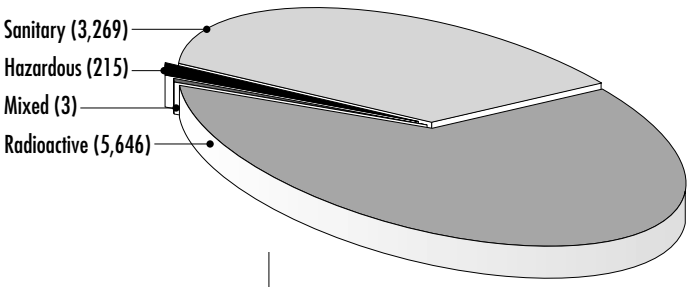


Table 4.11
1999 Ohio Field Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Ashtabula Environmental Management Project; Ashtabula, OH	1	3,342	$1,756
Columbus Environmental Management Project; Columbus, OH	3	66	$129
Fernald Environmental Management Project; Fernald, OH	11	1,627	$1,532
Miamisburg Environmental Management Project; Miamisburg, OH	10	2,588	$559
West Valley Demonstration Project; West Valley, NY	34	1,509	$678

4.9 Ohio Field Office

The Ohio Field Office provides administrative, financial, and technical support to Area Offices, allowing the Area Offices to complete their environmental restoration, waste management, and economic development activities in support of DOE's Complex-Wide Waste Reduction Goals.

4.9.1 Pollution Prevention Performance

In 1999, approximately 9,100 cubic meters of waste were reduced at the Ohio Field Office's five reporting sites through implementation of pollution prevention projects (Figure 4.34). As a result, the Ohio Field Office reduced the cost of operations by approximately $4.7 million.

4.9.2 Pollution Prevention Accomplishments

The Ohio Field Office reported 59 pollution prevention projects in 1999, accounting for approximately four percent of the waste reduction within the DOE Complex (Table 4.11). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.35 compares waste reduction by pollution prevention activity category, and Figure 4.36 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Copper destined for disposal was sent from the **Fernald Environmental Management Project** to Oak Ridge for reuse through the National Center of Excellence for Metals Recycle.

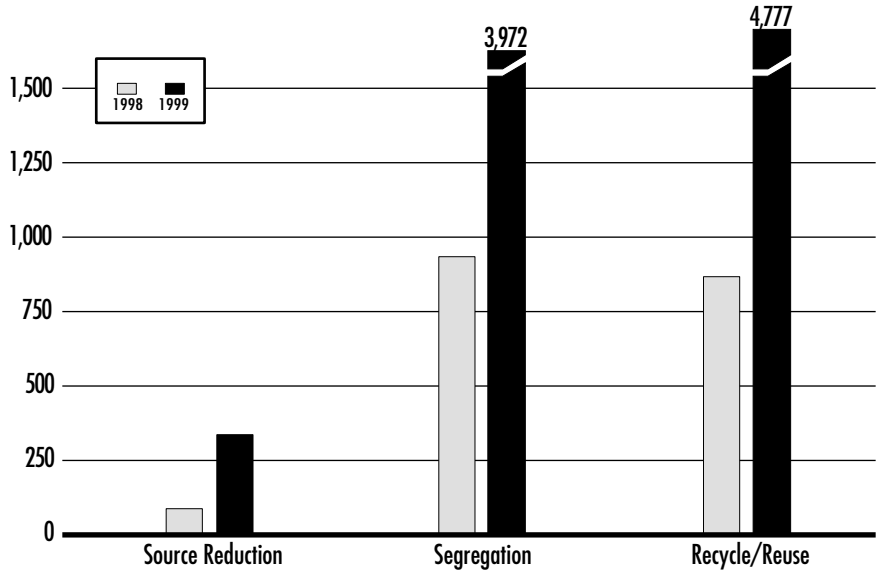


Figure 4.35 1998-1999 Ohio Field Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

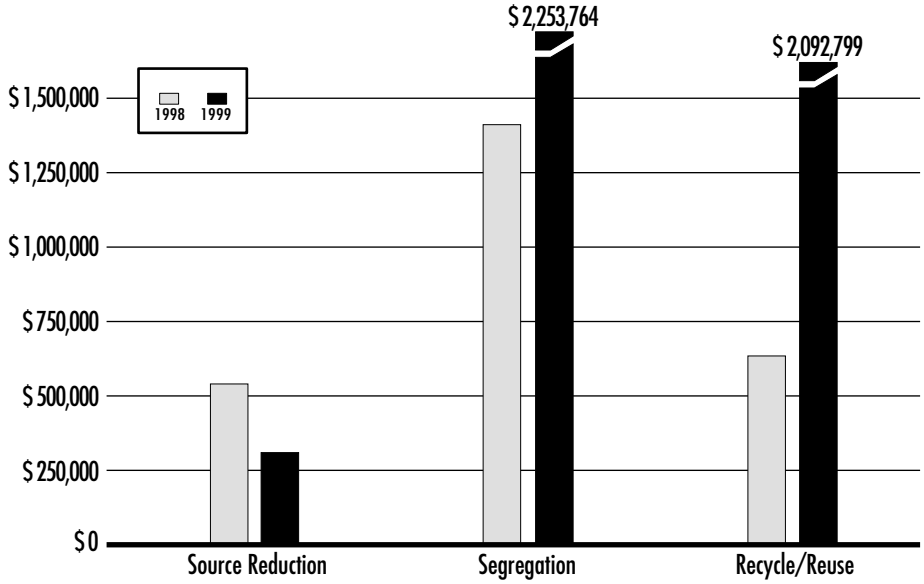


Figure 4.36 1998-1999 Ohio Field Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

This recycle/reuse activity reduced cleanup/stabilization low-level radioactive waste by 1,286 cubic meters, for a reported cost savings/avoidance of $1.5 million.

- Segregation activities were performed on lead-lined tanks, circuit boards, light fixtures, and disposable personal protective equipment at the **Miamisburg Environmental Management Project**. These segregation activities reduced cleanup/stabilization low-level radioactive waste by 380 cubic meters, for a reported cost savings/avoidance of $292,000.

- Excess vitrification chemicals at the **West Valley Demonstration Project** were returned to the manufacturer for recertification and reuse at the Hanford Site. This recycle/reuse activity reduced cleanup/stabilization sanitary waste by approximately 27 metric tons, for a reported cost savings/avoidance of $230,000.

4.9.3 Waste Generation

The total waste generated by Ohio Field Office reporting sites was approximately 466,300 cubic meters in 1999, accounting for approximately 51 percent of DOE's overall waste generation. Waste generated by the Ohio Field Office in 1999 is attributed entirely to Environmental Management.

In 1999, Ohio Field Office sites generated the most low-level radioactive waste within the DOE Complex (453,200 cubic meters, 59 percent; Figure 4.37). Most of this waste was generated by the Fernald Environmental Management Project due to cleanup/stabilization activities.

Routine operations waste generation of all waste types by Ohio Field Office sites decreased from 1998 to 1999, except for sanitary waste, which increased slightly.

Cleanup/stabilization transuranic, low-level radioactive, low-level mixed, and sanitary waste generation by Ohio Field Office sites increased from zero to one cubic meter, 47 percent (from 307,795 to 452,562 cubic meters), 315 percent (from 71 to 295 cubic meters), and 118 percent (from 2,195 to 4,779 metric tons), respectively, from 1998 to 1999. Cleanup/stabilization hazardous waste generation increased slightly from 1998 to 1999. The increase in transuranic waste generation is due to the Columbus Environmental Management Project's startup of sorting/segregation/packaging activities following approval of the Acceptable Knowlege Document for transuranic waste from the Carlsbad Area Office. The increase in low-level radioactive waste generation is primarily due to the Fernald Environmental Management Project's continued waste generation from deactivation and decommissioning operations for placement into the Onsite Disposal Facility. The increase in low-level mixed waste generation is due to Fernald Environmental Management Project activities. The increase in sanitary waste generation is primarily due to the Miamisburg Environmental Management Project's demolition and removal of building debris.

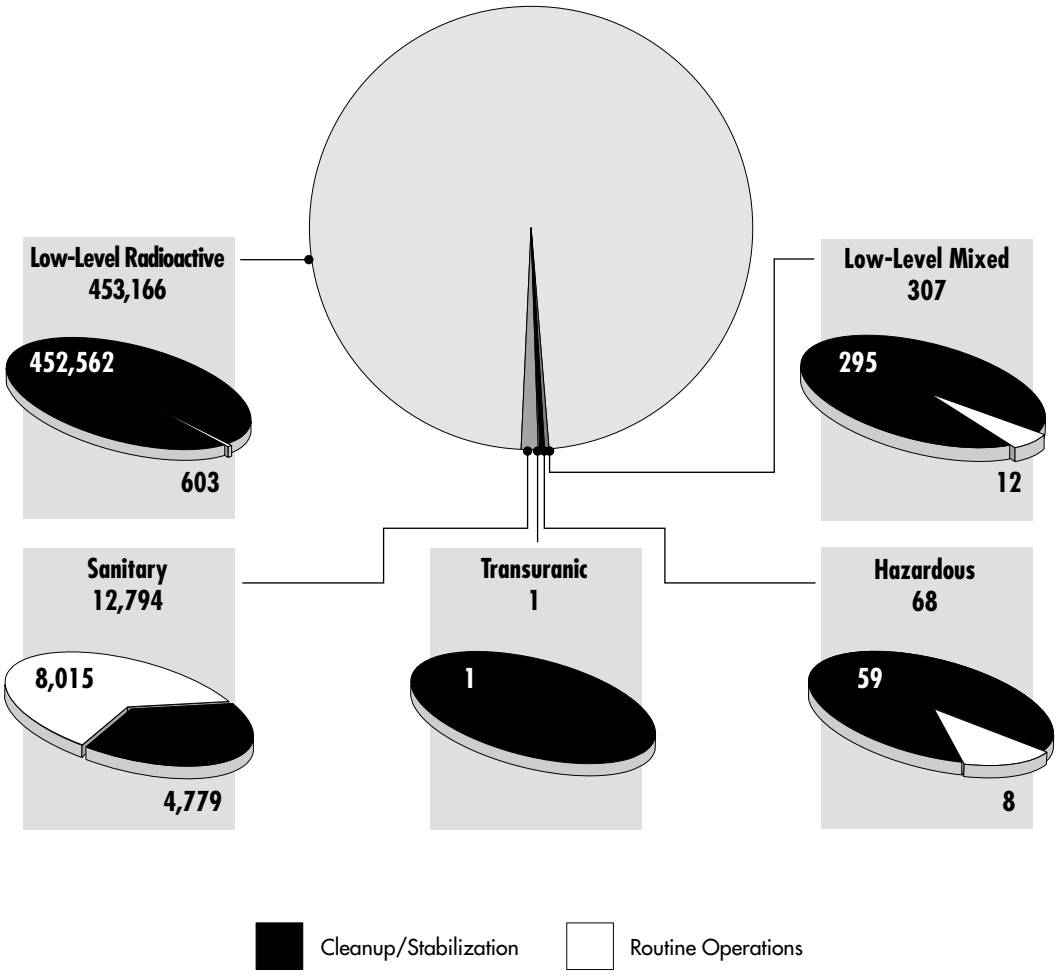


Figure 4.37 1999 Ohio Field Office Waste Generation by Waste Type (in Cubic Meters)

Richland Operations Office
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **99**

Total Waste Reduced: **129,563 cubic meters**

Reported Cost Savings/Avoidance: **$47.6 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	86% reduction	50%
Mixed Waste	77% reduction	50%
Hazardous Waste	79% reduction	50%
Sanitary Waste	87% reduction	33%
Recycling	57% recycled	33%
Affirmative Procurement	98% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.38
1999 Richland Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

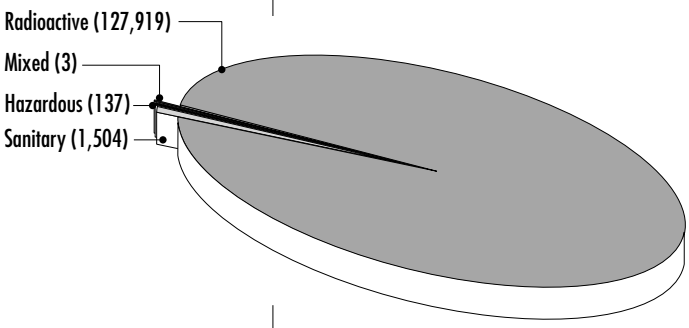


Table 4.12
1999 Richland Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Hanford Site; Richland, WA	70	129,360	$46,107
Pacific Northwest National Laboratory; Richland, WA	29	203	$1,507

4.10 Richland Operations Office

The Richland Operations Office manages the cleanup of the Hanford Site through environmental remediation, deactivation, and decommissioning. The office also manages the development and deployment of science and technology onsite and offsite.

4.10.1 Pollution Prevention Performance

In 1999, approximately 129,600 cubic meters of waste were reduced at the Richland Operations Office's two reporting sites through implementation of pollution prevention projects (Figure 4.38). As a result, the Richland Operations Office reduced the cost of operations by approximately $47.6 million.

4.10.2 Pollution Prevention Accomplishments

The Richland Operations Office reported 99 pollution prevention projects in 1999, accounting for approximately 62 percent of the waste reduction within the DOE Complex (Table 4.12). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.39 compares waste reduction by pollution prevention activity category, and Figure 4.40 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Waste sites included in the **Hanford Site's** Tri-Party Agreement were recategorized using a variety of techniques. As a result, 417 of the sites did not require further remedial action. This source reduction activity reduced cleanup/stabilization low-level radioactive waste by 48,624 cubic meters, for a reported cost avoidance of $36.3 million.

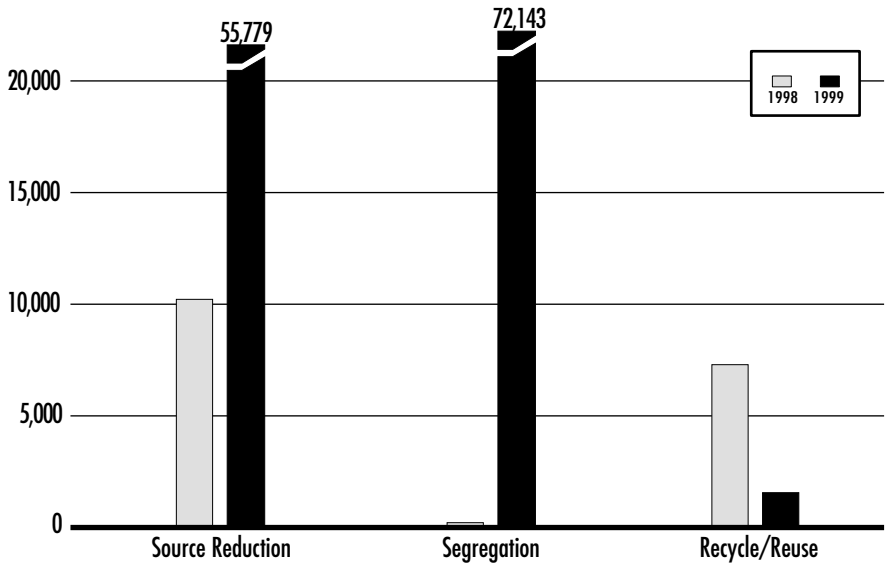


Figure 4.39 1998-1999 Richland Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

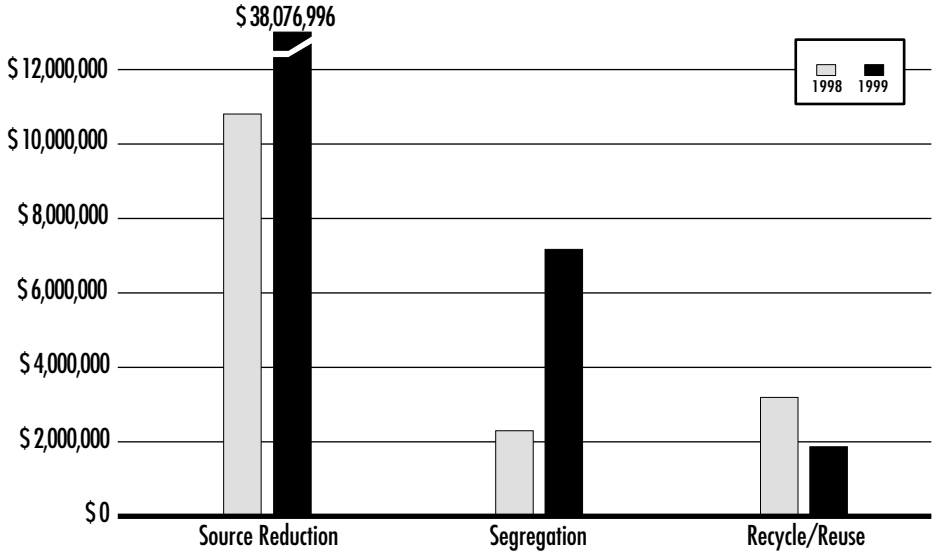


Figure 4.40 1998-1999 Richland Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

- The excavation of contaminated soil at the **Hanford Site** was minimized at the 100-D Area Group 2 Pipeline Project through the use of a GR-130 Gamma Spectrometer and E-600 survey instrument (which was developed with Return-on-Investment project funding). The successful implementation of these new, innovative instruments better identified the spread of contamination, and minimized the amount of soil requiring remediation. As a result of this effort, 93 percent of the excavated soil was determined to be free of contamination, and was able to be used as clean backfill. This segregation activity reduced cleanup/stabilization low-level radioactive waste by 71,200 cubic meters, for a reported cost savings/avoidance of approximately $5.1 million.

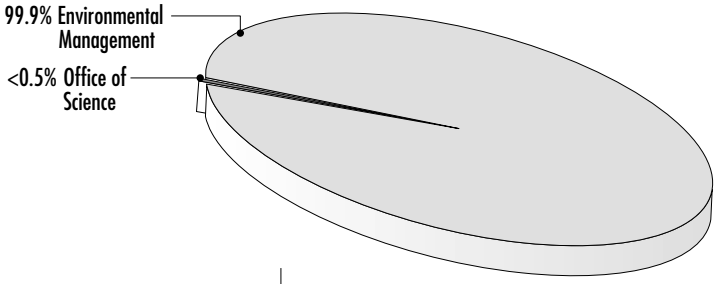
- Five cranes at the **Hanford Site** were decontaminated for free-release and sold. This segregation activity reduced routine operations low-level radioactive waste by 815 cubic meters, for a reported cost savings/avoidance of approximately $2.3 million.

- A new process for soil testing was implemented at the **Pacific Northwest National Laboratory**, enabling a smaller sample size and fewer tests. This source reduction activity reduced routine operations low-level mixed waste by approximately three cubic meters, for a reported cost savings/avoidance of $600,000.

4.10.3 Waste Generation

The total waste generated by Richland Operations Office reporting sites was approximately 291,900 cubic meters in 1999, accounting for approximately 32 percent of DOE's overall waste generation. Waste generated by the Richland Operations Office in 1999 is primarily attributed to Environmental Management (Figure 4.41).

Figure 4.41 1999 Richland Operations Office Waste Generation by Program Secretarial Office



In 1999, low-level radioactive waste generation of 289,900 cubic meters accounted for 99 percent of all waste generated by Richland Operations Office sites (Figure 4.42). Most of this waste was generated at the Hanford Site due to cleanup/stabilization activities.

Routine operations waste generation of all waste types by Richland Operations Office sites decreased from 1998 to 1999, except for sanitary waste, which remained approximately the same.

Cleanup/stabilization transuranic waste generation by Richland Operations Office sites increased 78 percent (from 18 to 32 cubic meters) from 1998 to 1999. The increase in transuranic waste generation is primarily due to mixed transuranic waste generated by the Hanford Site due to cleanup/stabilization activities.

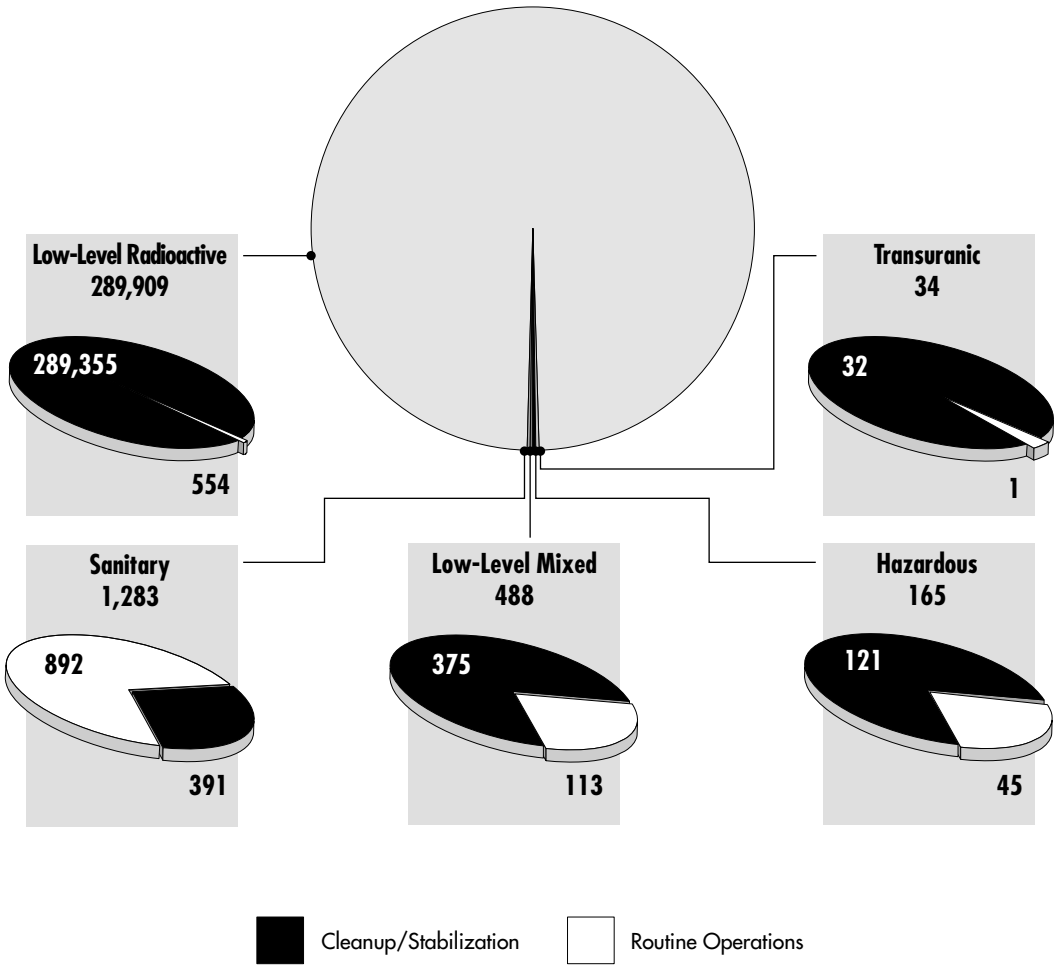


Figure 4.42 1999 Richland Operations Office Waste Generation by Waste Type (in Cubic Meters)

Rocky Flats Field Office
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects:	**39**
Total Waste Reduced:	**4,799 cubic meters**
Reported Cost Savings/Avoidance:	**$34.9 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	100% reduction**	50%
Mixed Waste	100% reduction**	50%
Hazardous Waste	100% reduction**	50%
Sanitary Waste	83% reduction	33%
Recycling	50% recycled	33%
Affirmative Procurement	99% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

** All waste generated in 1999 is primary waste from closure activities or secondary waste generated in support of closure as the total focus of the site has shifted to cleanup/stabilization activities.

Figure 4.43
1999 Rocky Flats Field Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

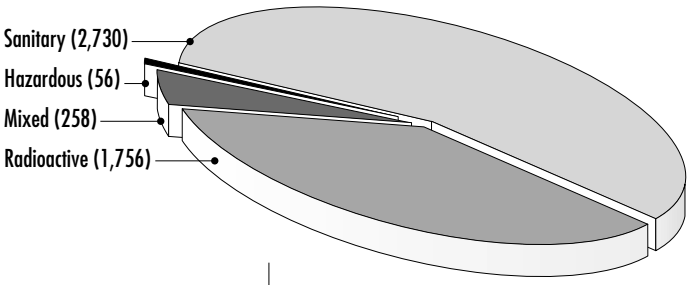


Table 4.13
1999 Rocky Flats Field Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Rocky Flats Environmental Technology Site; Golden, CO	39	4,799	$34,873

4.11 Rocky Flats Field Office

The Rocky Flats Field Office manages wastes and materials, environmental cleanup operations, and conversion of the Rocky Flats Environmental Technology Site to beneficial reuse.

4.11.1 Pollution Prevention Performance

In 1999, approximately 4,800 cubic meters of waste were reduced at the Rocky Flats Field Office's one reporting site through implementation of pollution prevention projects (Figure 4.43). As a result, the Rocky Flats Field Office reduced the cost of operations by approximately $34.9 million.

4.11.2 Pollution Prevention Accomplishments

The Rocky Flats Field Office reported 39 pollution prevention projects in 1999, accounting for approximately two percent of the waste reduction within the DOE Complex (Table 4.13). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.44 compares waste reduction by pollution prevention activity category, and Figure 4.45 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Three innovative technologies reduced secondary waste generation associated with repackaging of high-plutonium and high-americium content transuranic waste at the **Rocky Flats Environmental Technology Site**. A total of 4,820 drums of secondary waste were avoided through the use of the Pipe Overpack Container, filtered bag-out bags, and the Gas Generation Testing Canister. This source

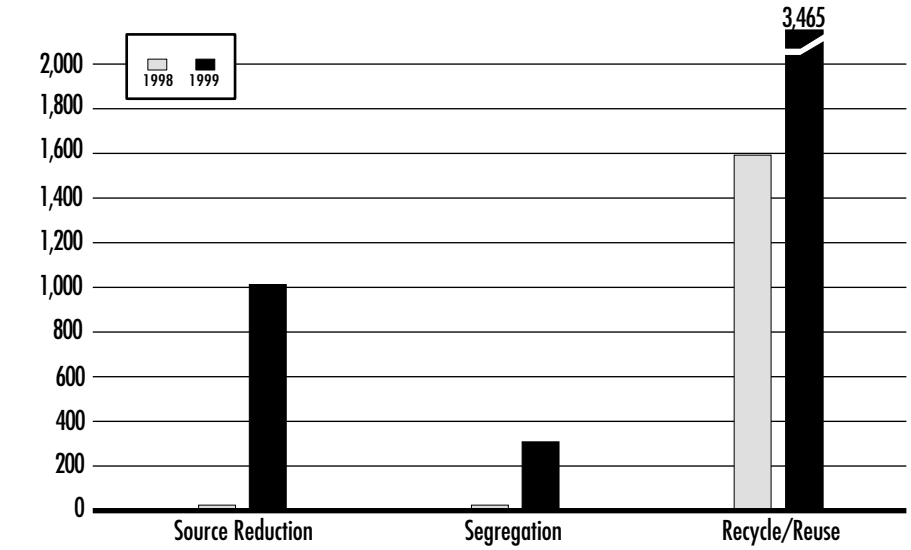


Figure 4.44
1998-1999 Rocky Flats Field Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

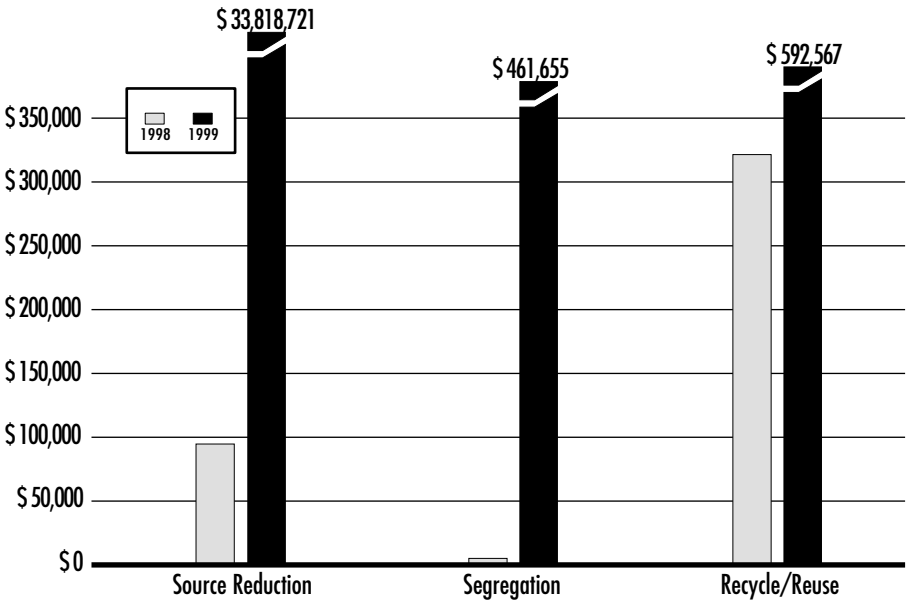


Figure 4.45
1998-1999 Rocky Flats Field Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

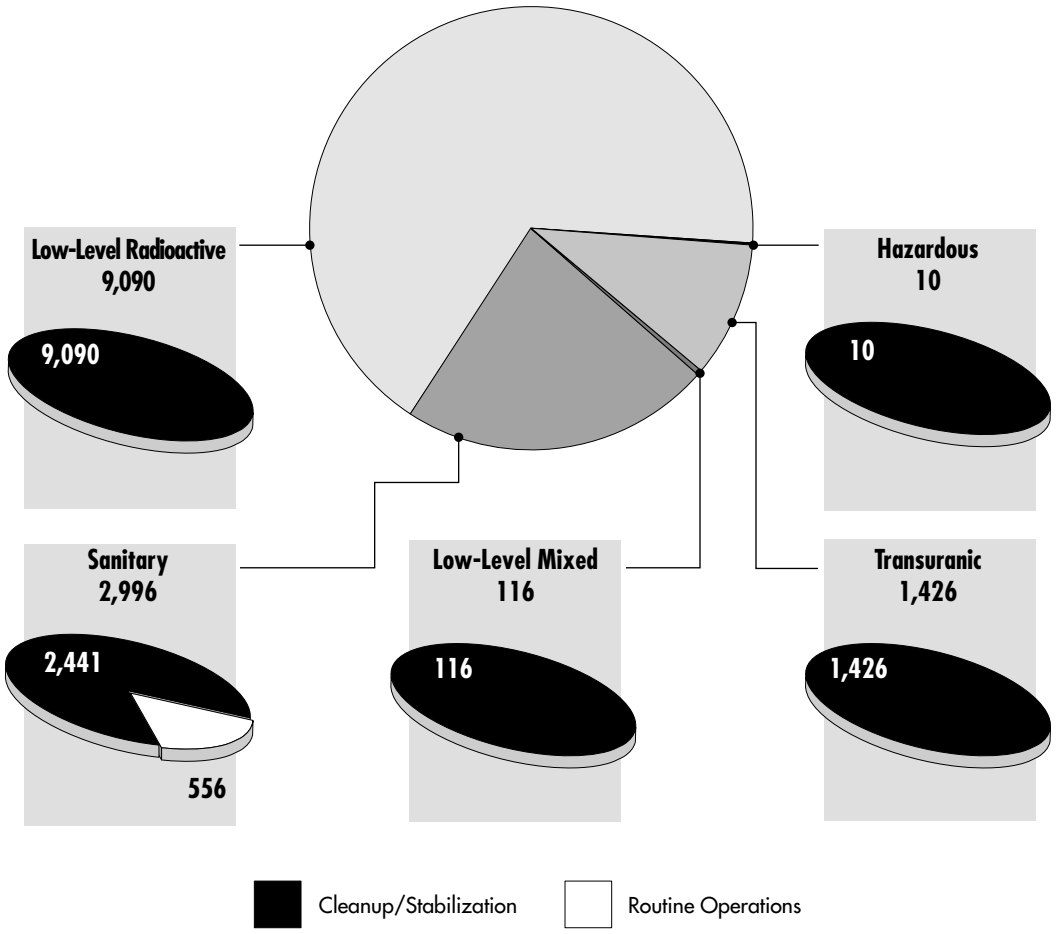
reduction activity reduced cleanup/stabilization transuranic waste by 1,002 cubic meters, for a reported cost savings/avoidance of approximately $33.7 million.

- Use of the Geoprobe instead of a hollow stem auger drill rig for drilling soil borings, collecting soil samples, installing wells, and taking groundwater samples reduced waste generation at the **Rocky Flats Environmental Technology Site**. By pushing through the soil, the Geoprobe avoids the drill-cutting waste that must be containerized, characterized, and disposed. This source reduction activity reduced cleanup/stabilization low-level mixed waste by approximately 26 cubic meters, for a reported cost savings/avoidance of $73,856.

4.11.3 Waste Generation

The total waste generated by the Rocky Flats Field Office's one reporting site was approximately 13,600 cubic meters in 1999, accounting for approximately one percent of

Figure 4.46 1999 Rocky Flats Field Office Waste Generation by Waste Type (in Cubic Meters)



DOE's overall waste generation. Waste generated by the Rocky Flats Field Office in 1999 is attributed entirely to Environmental Management.

In 1999, the Rocky Flats Environmental Technology Site generated the most transuranic waste within the DOE Complex (1,426 cubic meters, 80 percent; Figure 4.46). All of this waste was generated due to cleanup/stabilization activities.

Routine operations sanitary waste generation increased slightly from 1998 to 1999. In 1999, the Rocky Flats Environmental Technology Site defined all transuranic, low-level radioactive, low-level mixed, and hazardous wastes generated onsite as cleanup/stabilization waste because the total focus of the site has shifted to cleanup/stabilization activities. These activities include deactivation and decommissioning, and environmental restoration of contaminated soils and water.

Cleanup/stabilization transuranic and low-level radioactive waste generation by the Rocky Flats Environmental Technology Site increased 410 percent (from 280 to 1,426 cubic meters), and 87 percent (from 4,859 to 9,090 cubic meters), respectively, from 1998 to 1999. The increase in transuranic waste generation is due mainly to residue processing operations in the former plutonium production facility, Building 707. The increase in low-level radioactive waste generation is mainly due to the decommissioning and demolition of Building 779, a former nuclear research and development facility.

4.12 Savannah River Operations Office

The Savannah River Operations Office serves the national interest by providing leadership, direction, and oversight to ensure that Savannah River Site programs, operations, and resources are managed in an open, safe, environmentally sound, and cost-effective manner. The Office's previous mission was to produce nuclear materials for national defense.

4.12.1 Pollution Prevention Performance

In 1999, approximately 2,500 cubic meters of waste were reduced at the Savannah River Operations Office's one reporting site through implementation of pollution prevention projects (Figure 4.47). As a result, the Savannah River Operations Office reduced the cost of operations by approximately $12.1 million.

4.12.2 Pollution Prevention Accomplishments

The Savannah River Operations Office reported 46 pollution prevention projects in 1999, accounting for one percent of the waste reduction within the DOE Complex (Table 4.14). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.48 compares waste reduction by pollution prevention activity category, and Figure 4.49 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- The Solid Waste Division at the **Savannah River Site** implemented a process change at the Consolidated Incineration Facility to eliminate blowcrete waste (a stable concrete waste formed by combining liquid blowdown with cement) by

Savannah River Operations Office Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **46**

Total Waste Reduced: **2,449 cubic meters**

Reported Cost Savings/Avoidance: **$12.1 million**

Category	Performance Measure*	CY 99 Goal
Radioactive Waste	68% reduction	50%
Mixed Waste	202% increase**	50%
Hazardous Waste	59% reduction	50%
Sanitary Waste	74% reduction	33%
Recycling	39% recycled	33%
Affirmative Procurement	100% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

** Increase is due to the startup of the Consolidated Incineration Facility, which has generated secondary mixed waste since 1997.

Figure 4.47 1999 Savannah River Operations Office Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

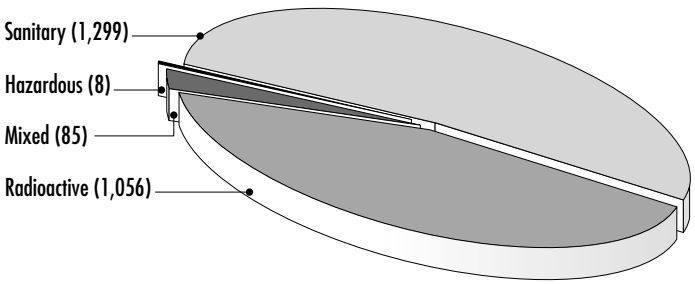


Table 4.14 1999 Savannah River Operations Office Pollution Prevention Accomplishments by Site

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Savannah River Site; Aiken, SC	46	2,449	$12,065

Figure 4.48 1998-1999 Savannah River Operations Office Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

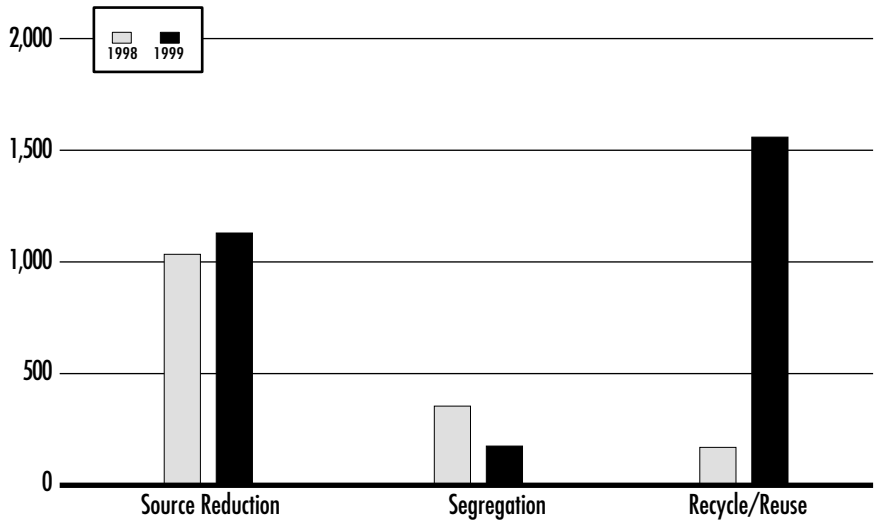
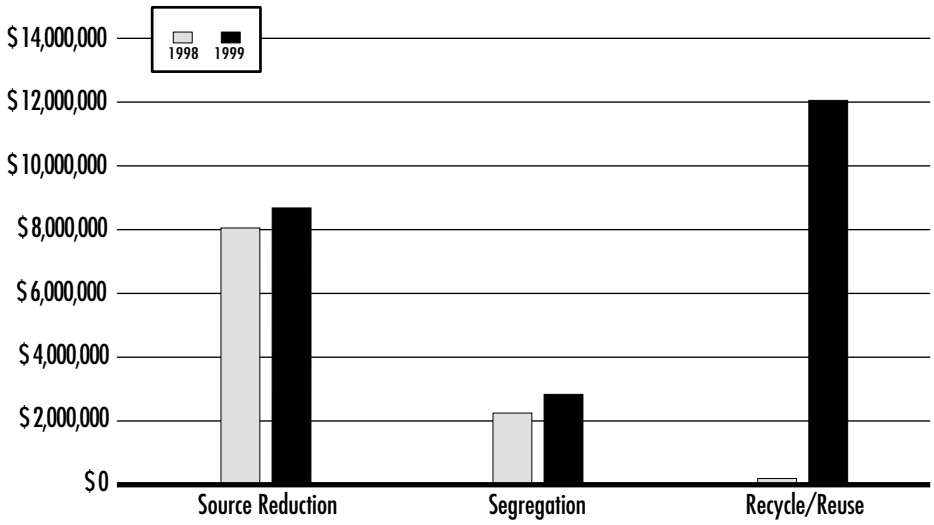


Figure 4.49 1998-1999 Savannah River Operations Office Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)

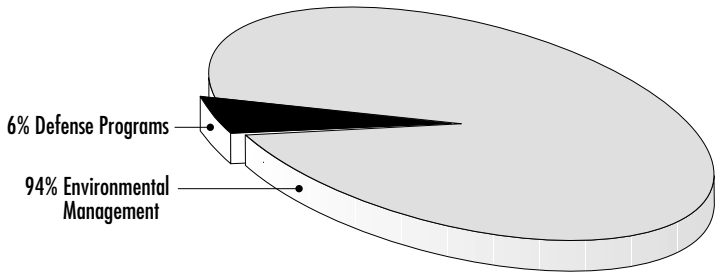


transferring the liquid blowdown to the Effluent Treatment Facility. This source reduction activity reduced routine operations low-level radioactive waste by approximately 444 cubic meters, for a reported cost savings/avoidance of approximately $3.3 million.

- The Facility Decommissioning Division at the **Savannah River Site** implemented various procedures to minimize the generation and disposal of polychlorinated biphenyl (PCB) contaminated materials in the Ford Building. These procedures included limiting entries into the contaminated area, establishing staging areas with tarps to prevent the contamination of materials brought into the contaminated area, sequencing of activities to prevent recontamination of "clean" areas, and implementing provisions of a new PCB rule to allow the screening of bulk remediation waste. This source reduction activity reduced cleanup/stabilization mixed TSCA (Toxic Substances Control Act) waste by approximately 32 cubic meters, for a reported cost savings/avoidance of approximately $1.9 million.

- A Glove Bag Program was implemented in the Nuclear Materials Stabilization and Storage Division at the **Savannah River Site** to resolve safety and waste issues associated with the installation and removal of containment huts. The program scope included increasing worker productivity, promoting waste minimization, and decreasing the lifecycle cost of launderable personal protective equipment, decontamination materials, and equipment. Activities completed include heat sealing equipment setup, containment facility setup, establishment of storage inventory, hands-on training support and procedures, mock support, and promotion of site-wide standardization of containment hut use. This source reduction activity reduced routine operations transuranic and low-level radioactive waste by approximately 29 cubic meters combined, for a total reported cost savings/avoidance of approximately $1 million.

Figure 4.50
1999 Savannah River Operations Office Waste Generation by Program Secretarial Office



4.12.3 Waste Generation

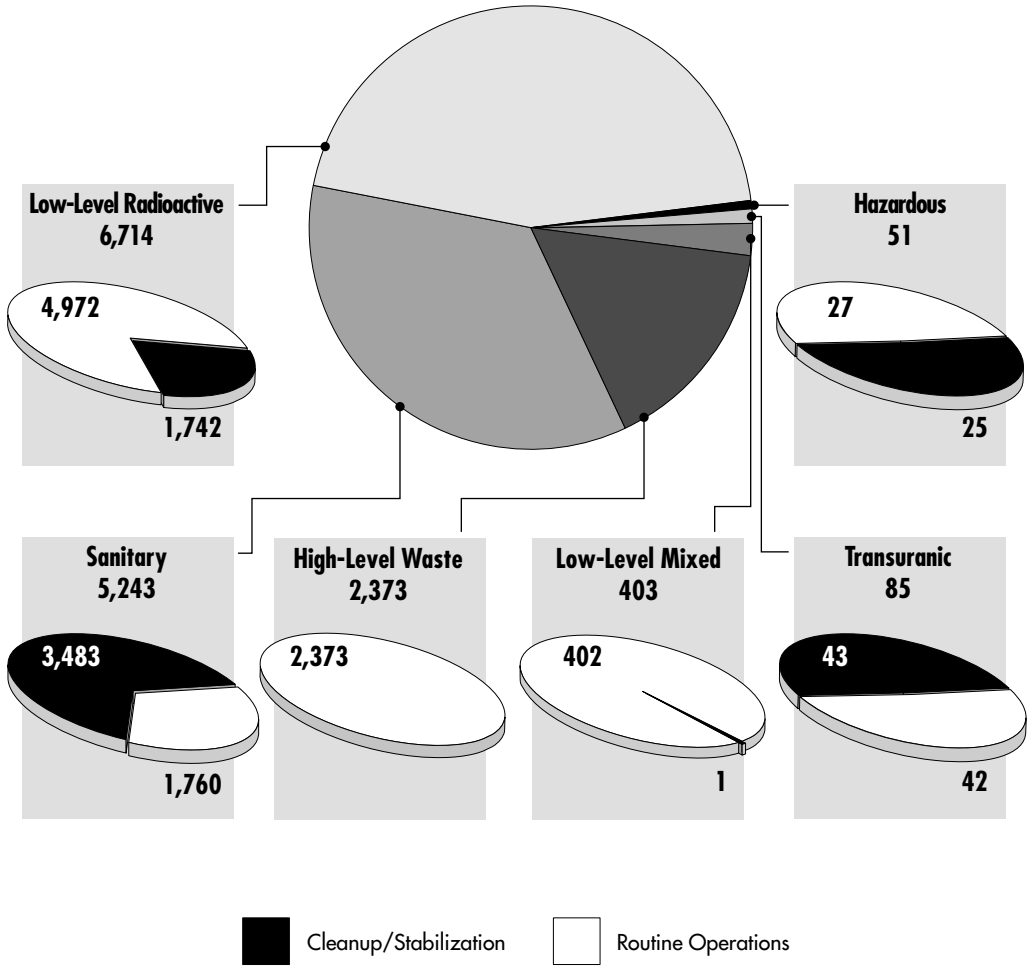
The total waste generated by the Savannah River Operations Office's one reporting site was approximately 14,900 cubic meters in 1999, accounting for approximately two percent of DOE's overall waste generation. Waste generated by the Savannah River Operations Office in 1999 is primarily attributed to Environmental Management (Figure 4.50).

In 1999, the Savannah River Site generated all of the high-level waste within the DOE Complex (2,400 cubic meters; Figure 4.51). This waste was generated due to routine operations activities.

Routine operations waste generation of all waste types by the Savannah River Site decreased from 1998 to 1999, except for high-level waste, which increased slightly.

Cleanup/stabilization transuranic, low-level radioactive, and sanitary waste generation by the Savannah River Site increased from zero to 43 cubic meters, 261 percent (from 483 to 1,742 cubic meters), and 55 percent (from 2,250 to 3,483 metric tons), respectively, from 1998 to 1999. The increase in transuranic waste generation is due to the continuation of a Calendar Year 1998 cleanup project involving americium/curium equipment racks and other legacy materials. The increase in low-level radioactive waste generation is due to prior planned demolition and remediation projects funded during 1999 to commence cleanup activities. The increase in sanitary waste generation is attributed to a new construction project, in addition to continued site-wide roofing repair activities.

Figure 4.51
1999 Savannah River Operations Office Waste Generation by Waste Type (in Cubic Meters)



4.13 Headquarters

The DOE sites reporting to Headquarters include the Albany Research Center, Federal Energy Technology Center (Pittsburgh and Morgantown), Southeastern Power Administration, Southwestern Power Administration, Strategic Petroleum Reserve Project Management Office, Western Area Power Administration, and the Yucca Mountain Site Characterization Office. The primary missions of these sites are research and development, fossil energy, and power marketing.

4.13.1 Pollution Prevention Performance

In 1999, approximately 4,200 cubic meters of waste were reduced at two of the Headquarters' reporting sites through implementation of pollution prevention projects (Figure 4.52). As a result, Headquarters reduced the cost of operations by $141,250.

4.13.2 Pollution Prevention Accomplishments

Headquarters sites reported 17 pollution prevention projects in 1999, accounting for two percent of the waste reduction within the DOE Complex (Table 4.15). Note that only new projects are included in the pollution prevention project totals in this Report. Ongoing source reduction and segregation projects have been excluded from these totals to be consistent with previous years' Annual Report data. Ongoing source reduction and segregation projects did result in significant waste reductions and cost savings in Calendar Year 1999, and these projects are described in Section 3.5 of this Report. Figure 4.53 compares waste reduction by pollution prevention activity category, and Figure 4.54 compares reported cost savings/avoidance by pollution prevention activity category, for 1998 and 1999. Examples of pollution prevention projects completed in 1999 include:

- Asphalt from a parking lot construction project at the **Western Area Project Administration's** Loveland, Colorado office was reused onsite.

Headquarters
Calendar Year 1999 Achievements

Number of Pollution Prevention Projects: **17**

Total Waste Reduced: **4,158 cubic meters**

Reported Cost Savings/Avoidance: **$141,250**

Category	Performance Measure*	CY 99 Goal
Hazardous Waste	78% reduction	50%
Sanitary Waste	75% reduction	33%
Recycling	65% recycled	33%
Affirmative Procurement	65% purchased	100%

* Performance measure comparison is from 1993 to 1999, except for recycling and affirmative procurement, for which performance is assessed annually.

Figure 4.52
1999 Headquarters Pollution Prevention Waste Reduction by Waste Category (in Cubic Meters)

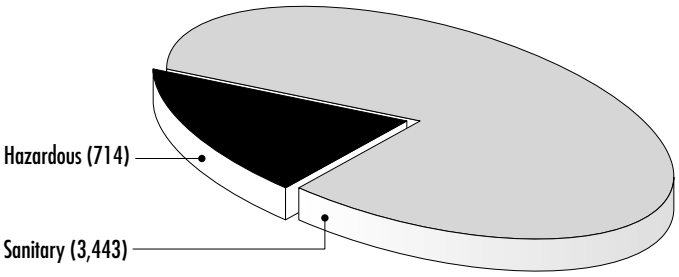


Table 4.15
1999 Headquarters Pollution Prevention Accomplishments by Site*

Site Name; Location	Number of Pollution Prevention Projects	Waste Reduction (Cubic Meters)	Reported Cost Savings/Avoidance (Thousands)
Western Area Power Administration; Golden, CO	15	4,156	$137
Yucca Mountain Site Characterization Office; North Las Vegas, NV	2	1	$4

* Sites that did not report pollution prevention projects in 1999 are not included in this table.

Figure 4.53
1998-1999 Headquarters Waste Reduction by Pollution Prevention Activity Category (in Cubic Meters)

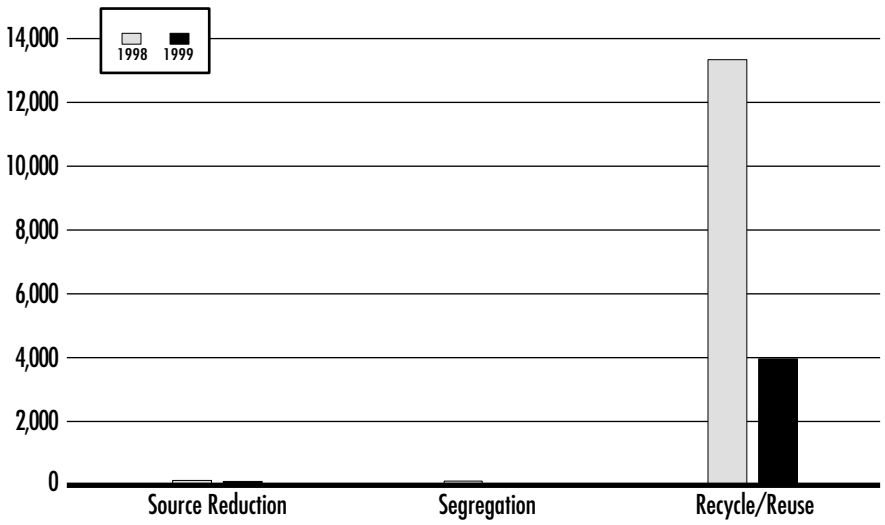
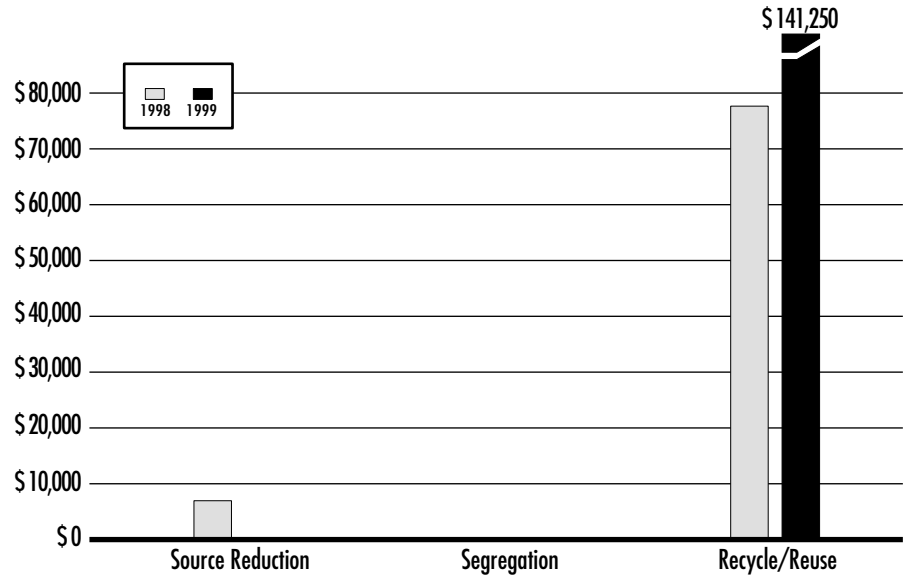


Figure 4.54
1998-1999 Headquarters Reported Cost Savings/Avoidance by Pollution Prevention Activity Category (in Dollars)



This recycle/reuse activity reduced cleanup/stabilization sanitary waste by approximately 1,452 metric tons, for a reported cost savings/avoidance of $61,000.

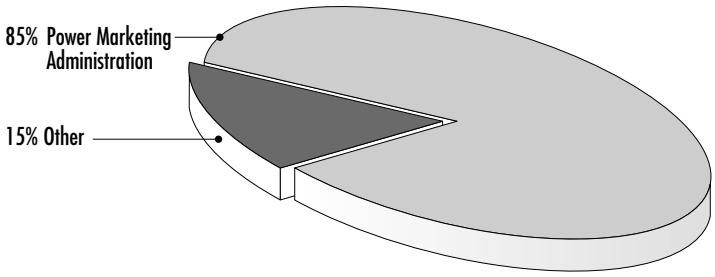
- At the **Yucca Mountain Site Characterization Office**, excess 9-volt batteries were donated to public schools and fire departments for use in fire alarms. This recycle/reuse activity reduced routine operations sanitary waste by less than one metric ton, for a reported cost savings/avoidance of $4,250.

4.13.3 Waste Generation

The total waste generated by Headquarters reporting sites was approximately 3,500 metric tons in 1999, accounting for less than one percent of DOE's overall waste generation. Waste generated by Headquarters in 1999 is primarily attributed to the Power Marketing Administration (Figure 4.55).

In 1999, sanitary waste generation of 3,300 metric tons accounted for 97 percent of all waste generated by Headquarters sites (Figure 4.56). Most of this waste was generated at the Western Area Power Administration due to routine operations activities.

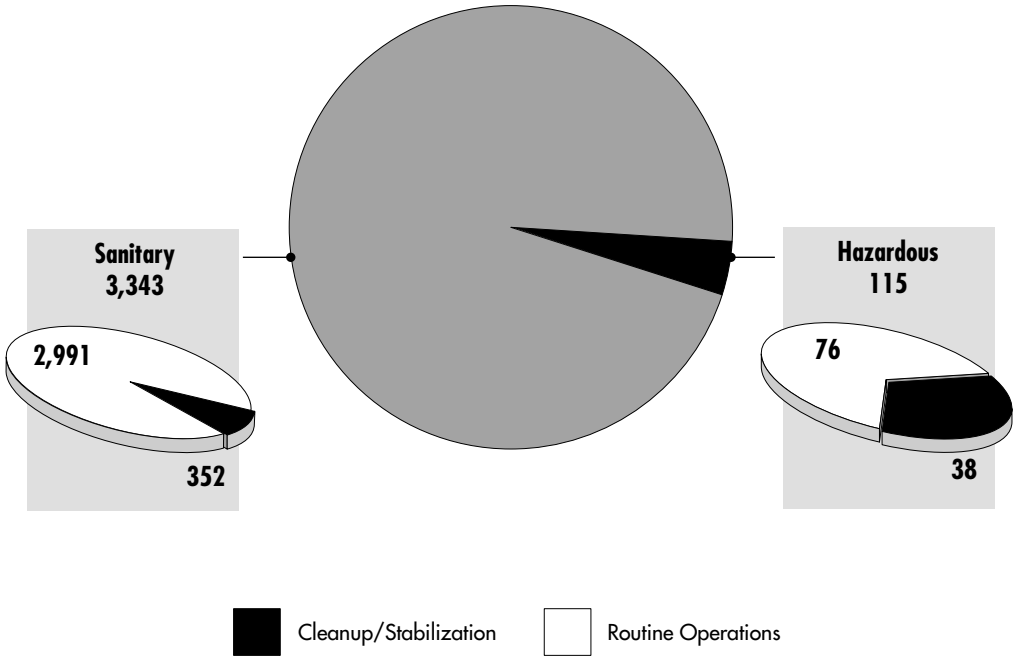
Figure 4.55
1999 Headquarters Waste Generation by Program Secretarial Office



Routine operations sanitary waste generation by Headquarters sites increased 58 percent (from 1,895 to 2,991 metric tons) from 1998 to 1999. The increase in sanitary waste generation is primarily due to reporting by the Albany Research Center and Yucca Mountain Site Characterization Office, sites that did not report sanitary waste generation in 1998.

Cleanup/stabilization sanitary waste generation by Headquarters sites increased 935 percent (from 34 to 352 metric tons) from 1998 to 1999. The increase in sanitary waste generation is due to the Western Area Power Administration's landfill waste in the Upper Great Plains region (oil spills, damaged utility poles, and debris from demolished buildings).

Figure 4.56
1999 Headquarters Waste Generation by Waste Type (in Cubic Meters)



Appendix A

Data Tables

This Appendix presents Calendar Year 1999 pollution prevention accomplishment and waste generation data for the DOE Complex.

Table A-1
Waste Reduction from Pollution Prevention Projects in 1999, for All Waste Types, by Operations/Field Office* (in Cubic Meters)

Operations/ Field Office	High-Level	Transuranic	Low-Level Radioactive	Low-Level Mixed	Hazardous	Sanitary	TOTAL REPORTED WASTE REDUCTION
Albuquerque	0	3	459	13	335	8,181	8,991
Chicago	0	0	13	50	705	5,224	5,992
Idaho	0	0	262	275	317	7,647	8,501
Nevada	0	0	0	0	93	1,130	1,223
Oakland	0	<0.5	804	<0.5	1,435	283	2,523
Oak Ridge	0	0	4,608	1,194	130	26,342	32,274
Ohio	310**	<0.5	5,335	3	215	3,269	9,132
Richland	0	0	127,919	3	137	1,504	129,563
Rocky Flats	0	1,002	754	258	56	2,730	4,799
Savannah River	0	6	1,050	85	8	1,299	2,449
Headquarters	0	0	0	0	714	3,443	4,158
TOTAL	**310**	**1,012**	**141,205**	**1,880**	**4,144**	**61,053**	**209,605**

* Numbers have been rounded to the nearest cubic meter.

** Waste reduction is due to the West Valley Demonstration Project's retrofit of two pumps to eliminate pump seal water accumulation in high-level radioactive waste storage tanks.

Table A-2
Reported Cost Savings/Avoidance from Pollution Prevention Projects in 1999, for All Waste Types, by Operations/Field Office*

Operations/ Field Office	High-Level	Transuranic	Low-Level Radioactive	Low-Level Mixed	Hazardous	Sanitary	TOTAL REPORTED COST SAVINGS
Albuquerque	$0	$166,500	$878,413	$541,387	$2,645,005	$335,679	$4,566,984
Chicago	$0	$0	$46,532	$85,700	$293,790	$62,077,669	$62,503,691
Idaho	$0	$0	$537,968	$3,025,096	$6,513,155	$16,852,284	$26,928,503
Nevada	$0	$0	$0	$0	$10,439	$90,101	$100,540
Oakland	$0	$5,000	$1,642,000	$7,500	$967,620	$70,000	$2,692,120
Oak Ridge	$0	$0	$1,115,391	$1,048,733	$1,065,530	$1,820,902	$5,050,556
Ohio	$167,800	$12,300	$3,782,536	$94,744	$109,640	$487,348	$4,654,368
Richland	$0	$0	$44,947,335	$626,993	$1,247,901	$792,040	$47,614,269
Rocky Flats	$0	$33,740,000	$115,498	$420,013	$278,753	$318,679	$34,872,943
Savannah River	$0	$207,287	$7,361,239	$4,402,797	$71,304	$22,250	$12,064,877
Headquarters	$0	$0	$0	$0	$0	$141,250	$141,250
TOTAL	**$167,800**	**$34,131,087**	**$60,426,912**	**$10,252,963**	**$13,203,137**	**$83,008,202**	**$201,190,101**

* Numbers have been rounded to the nearest dollar.

Table A-3
High-Level Waste Generation in 1999 by Site (in Cubic Meters)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Savannah River Site	2,373	0	2,373
TOTAL	**2,373**	**0**	**2,373**

Table A-4
Transuranic* Waste Generation in 1999 by Site (in Cubic Meters)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Rocky Flats Environmental Technology Site	0.00	1,425.87	1,425.87
Los Alamos National Laboratory	121.69	109.53	231.22
Savannah River Site	42.35	42.80	85.15
Hanford Site	0.00	32.46	32.46
Pacific Northwest National Laboratory	1.37	0.00	1.37
Columbus Environmental Management Project	0.00	1.33	1.33
Argonne National Laboratory - West	1.22	0.00	1.22
Oak Ridge National Laboratory	0.32	0.70	1.02
Idaho National Engineering and Environmental Laboratory	0.00	0.06	0.06
Lawrence Livermore National Laboratory	0.03	0.00	0.03
TOTAL	**166.98**	**1,612.75**	**1,779.73**

* Includes mixed transuranic waste.

Table A-5
Low-Level Radioactive Waste Generation in 1999 by Site (in Cubic Meters)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Fernald Environmental Management Project	274.22	438,997.38	439,271.60
Hanford Site	370.61	289,345.00	289,715.61
Rocky Flats Environmental Technology Site	0.00	9,090.43	9,090.43
Savannah River Site	4,972.00	1,742.13	6,714.13
Columbus Environmental Management Project	0.00	6,480.00	6,480.00
Miamisburg Environmental Management Project	0.00	5,997.71	5,997.71
Idaho National Engineering and Environmental Laboratory	1,493.43	1,010.64	2,504.07
East Tennessee Technology Park	21.78	1,932.88	1,954.66
Oak Ridge Y-12 Plant	1,404.06	0.53	1,404.59
Los Alamos National Laboratory	717.33	514.35	1,231.68
Lawrence Livermore National Laboratory	174.46	1,028.95	1,203.41
Ashtabula Environmental Management Project	0.00	827.87	827.87
Nevada Test Site	7.10	776.05	783.15
Oak Ridge National Laboratory	294.02	465.39	759.41
West Valley Demonstration Project	329.27	259.38	588.65
Argonne National Laboratory - West	280.40	261.42	541.82
Paducah Gaseous Diffusion Plant	0.00	410.95	410.95
Pantex Plant	91.76	313.60	405.36
Sandia National Laboratories/New Mexico	27.32	326.38	353.70
Brookhaven National Laboratory	240.80	87.50	328.30
Portsmouth Gaseous Diffusion Plant	0.00	326.44	326.44
Energy Technology Engineering Center	0.00	256.07	256.07
Pacific Northwest National Laboratory	183.68	9.50	193.18
Argonne National Laboratory - East	72.67	52.21	124.88
Fermi National Accelerator Laboratory	85.87	0.00	85.87
Stanford Linear Accelerator Center	0.00	57.09	57.09
Princeton Plasma Physics Laboratory	33.65	0.00	33.65
Lawrence Berkeley National Laboratory	16.21	6.97	23.18
Oak Ridge Institute for Science and Education	3.80	9.60	13.40
Grand Junction Projects Office	5.13	0.00	5.13
Sandia National Laboratories/California	0.00	4.52	4.52
Thomas Jefferson National Accelerator Facility	3.02	0.00	3.02
Ames Laboratory	2.40	0.00	2.40
Kansas City Plant	0.29	0.00	0.29
TOTAL	**11,105.28**	**760,590.94**	**771,696.22**

Table A-6
Low-Level Mixed* Waste Generation in 1999 by Site (in Cubic Meters)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Oak Ridge Y-12 Plant	69.42	739.56	808.98
East Tennessee Technology Park	121.93	607.90	729.83
Hanford Site	96.77	368.11	464.88
Savannah River Site	402.33	0.69	403.02
Los Alamos National Laboratory	5.84	309.40	315.24
Portsmouth Gaseous Diffusion Plant	0.00	292.12	292.12
Fernald Environmental Management Project	10.71	251.39	262.10
Brookhaven National Laboratory	3.73	185.50	189.23
Rocky Flats Environmental Technology Site	0.00	116.08	116.08
Lawrence Livermore National Laboratory	31.49	81.40	112.89
Idaho National Engineering and Environmental Laboratory	39.62	60.29	99.91
Paducah Gaseous Diffusion Plant	0.00	69.34	69.34
Ashtabula Environmental Management Project	0.00	43.96	43.96
Nevada Test Site	0.00	42.86	42.86
Argonne National Laboratory - West	1.19	27.99	29.18
Argonne National Laboratory - East	1.23	22.18	23.41
Pacific Northwest National Laboratory	16.42	6.50	22.92
Energy Technology Engineering Center	0.00	9.87	9.87
Sandia National Laboratories/New Mexico	2.03	6.89	8.92
Oak Ridge National Laboratory	1.42	7.18	8.60
Lawrence Berkeley National Laboratory	0.64	0.65	1.29
Pantex Plant	1.04	0.00	1.04
West Valley Demonstration Project	0.96	0.00	0.96
Oak Ridge Institute for Science and Education	0.01	0.30	0.31
Fermi National Accelerator Laboratory	0.20	0.00	0.20
Sandia National Laboratories/California	0.03	0.00	0.03
Ames Laboratory	0.02	0.00	0.02
TOTAL	**807.03**	**3,250.16**	**4,057.19**

* Includes low-level mixed and Toxic Substances Control Act mixed waste.

Table A-7
Hazardous* Waste Generation in 1999 by Site (in Metric Tons)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Los Alamos National Laboratory	32.86	15,342.66	15,375.52
Stanford Linear Accelerator Center	51.69	3,475.04	3,526.73**
Brookhaven National Laboratory	64.40	765.50	829.90
Argonne National Laboratory - East	46.67	779.80	826.47
Lawrence Livermore National Laboratory	168.83	478.04	646.87
Kansas City Plant	65.68	439.06	504.74
Sandia National Laboratories/New Mexico	103.63	194.29	297.92
Fermi National Accelerator Laboratory	38.10	142.00	180.10
Pantex Plant	120.60	12.69	133.29
Hanford Site	5.55	118.81	124.36
Idaho National Engineering and Environmental Laboratory	29.77	62.09	91.86
Sandia National Laboratories/California	25.49	47.49	72.98
Miamisburg Environmental Management Project	2.05	50.21	52.26
Savannah River Site	26.51	24.60	51.11
Lawrence Berkeley National Laboratory	41.55	7.91	49.46
Western Area Power Administration	48.39	0.61	49.00
Southwestern Power Administration	17.98	30.63	48.61
Pacific Northwest National Laboratory	39.14	1.94	41.08
Energy Technology Engineering Center	0.00	34.95	34.95
Waste Isolation Pilot Plant	30.38	0.00	30.38
Nevada Test Site	17.14	13.03	30.17
Oak Ridge Y-12 Plant	18.45	7.35	25.80
Princeton Plasma Physics Laboratory	3.83	18.83	22.66
Argonne National Laboratory - West	1.88	17.46	19.34
Oak Ridge National Laboratory	6.91	9.07	15.98
Paducah Gaseous Diffusion Plant	0.00	10.34	10.34
Rocky Flats Environmental Technology Site	0.00	10.07	10.07
Ashtabula Environmental Management Project	0.00	8.13	8.13
Albany Research Center	0.52	6.90	7.42
East Tennessee Technology Park	3.08	3.47	6.55
Portsmouth Gaseous Diffusion Plant	0.00	6.01	6.01
West Valley Demonstration Project	5.96	0.00	5.96
Thomas Jefferson National Accelerator Facility	5.42	0.00	5.42
Ames Laboratory	5.09	0.00	5.09
Federal Energy Technology Center - Pittsburgh	4.89	0.00	4.89
Strategic Petroleum Reserve Project Management Office	4.00	0.00	4.00
Fernald Environmental Management Project	0.41	0.97	1.38
Oak Ridge Institute for Science and Education	1.04	0.00	1.04
Yucca Mountain Site Characterization Office	0.59	0.00	0.59
Grand Junction Projects Office	0.15	0.00	0.15
Office of Scientific and Technical Information	0.13	0.00	0.13
Environmental Measurements Laboratory	0.11	0.00	0.11
TOTAL	**1,038.87**	**22,119.95**	**23,158.82**

* Includes Resource Conservation and Recovery Act regulated, State regulated, and Toxic Substances Control Act regulated waste.

** Includes 2,100 metric tons of nonhazardous State regulated waste.

Table A-8
Sanitary Waste Generation in 1999 by Site (in Metric Tons)

Site	Routine Operations	Cleanup/Stabilization	TOTAL
Idaho National Engineering and Environmental Laboratory	1,117.00	24,200.00	25,317.00
Sandia National Laboratories/New Mexico	3,434.00	10,130.00	13,564.00
Nevada Test Site	7,456.86	5,157.26	12,614.12
Los Alamos National Laboratory	2,537.92	7,581.37	10,119.29
Fernald Environmental Management Project	7,410.00	351.00	7,761.00
Oak Ridge Y-12 Plant	7,294.81	19.16	7,313.97
Savannah River Site	1,760.00	3,483.00	5,243.00
Lawrence Livermore National Laboratory	1,805.29	3,053.37	4,858.66
Miamisburg Environmental Management Project	315.00	4,193.00	4,508.00
Paducah Gaseous Diffusion Plant	0.00	4,507.00	4,507.00
Oak Ridge National Laboratory	1,959.81	1,233.20	3,193.01
Rocky Flats Environmental Technology Site	555.51	2,440.50	2,996.01
Argonne National Laboratory - East	539.41	1,560.94	2,100.35
Kansas City Plant	1,758.60	0.00	1,758.60
Western Area Power Administration	1,362.95	352.41	1,715.36
Hanford Site	760.79	390.52	1,151.31
Argonne National Laboratory - West	787.24	0.00	787.24
Waste Isolation Pilot Plant	750.67	0.00	750.67
Yucca Mountain Site Characterization Office	681.40	0.00	681.40
Lawrence Berkeley National Laboratory	643.00	0.00	643.00
Brookhaven National Laboratory	630.60	0.00	630.60
Pantex Plant	618.57	0.00	618.57
Stanford Linear Accelerator Center	495.83	0.00	495.83
West Valley Demonstration Project	290.10	197.00	487.10
East Tennessee Technology Park	218.79	203.98	422.77
Fermi National Accelerator Laboratory	386.00	0.00	386.00
Strategic Petroleum Reserve Project Management Office	361.93	0.00	361.93
Federal Energy Technology Center - Pittsburgh	337.62	0.00	337.62
Grand Junction Projects Office	326.78	0.00	326.78
Sandia National Laboratories/California	182.49	141.99	324.48
Albany Research Center	222.00	0.00	222.00
Thomas Jefferson National Accelerator Facility	218.40	0.00	218.40
Pacific Northwest National Laboratory	131.21	0.00	131.21
Princeton Plasma Physics Laboratory	82.09	0.00	82.09
Energy Technology Engineering Center	65.65	0.00	65.65
Ashtabula Environmental Management Project	0.00	37.76	37.76
Southwestern Power Administration	25.00	0.00	25.00
Oak Ridge Institute for Science and Education	1.00	0.00	1.00
TOTAL	**47,524.32**	**69,233.46**	**116,757.78**

Table A-9
1999 Total Routine Operations and Cleanup/Stabilization Waste Generation by Program and Waste Type (in Cubic Meters)

Program	High-Level			Transuranic		
	Routine Operations	Cleanup/ Stabilization	Total High-Level	Routine Operations	Cleanup/ Stabilization	Total Transuranic
Defense Programs	0	0	**0**	121	70	**190**
Office of Science	0	0	**0**	1	1	**2**
Environmental Management	2,373	0	**2,373**	43	1,542	**1,585**
Nuclear Energy	0	0	**0**	1	0	**1**
Power Marketing Administration	0	0	**0**	0	0	**0**
Others*	0	0	**0**	1	0	**1**
TOTAL	**2,373**	**0**	**2,373**	**167**	**1,613**	**1,780**

Program	Low-Level Radioactive			Low-Level Mixed		
	Routine Operations	Cleanup/ Stabilization	Total Low-Level Radioactive	Routine Operations	Cleanup/ Stabilization	Total Low-Level Mixed
Defense Programs	3,042	1,622	**4,664**	52	145	**197**
Office of Science	762	243	**1,005**	24	195	**218**
Environmental Management	6,637	758,362	**764,999**	730	2,877	**3,606**
Nuclear Energy	617	364	**981**	2	30	**32**
Power Marketing Administration	0	0	**0**	0	0	**0**
Others*	48	0	**48**	0	3	**3**
TOTAL	**11,105**	**760,591**	**771,696**	**807**	**3,250**	**4,057**

Program	Hazardous			TOTAL EXCLUDING SANITARY	Sanitary			GRAND TOTAL
	Routine Operations	Cleanup/ Stabilization	Total Hazardous		Routine Operations	Cleanup/ Stabilization	Total Sanitary	
Defense Programs	515	3,855	**4,370**	**9,422**	25,089	26,083	**51,172**	**60,594**
Office of Science	315	2,921	**3,236**	**4,461**	5,087	2,794	**7,881**	**12,343**
Environmental Management	117	15,222	**15,339**	**787,902**	13,570	40,004	**53,574**	**841,476**
Nuclear Energy	8	84	**91**	**1,105**	787	0	**787**	**1,892**
Power Marketing Administration	66	31	**98**	**98**	1,388	352	**1,740**	**1,838**
Others*	18	7	**25**	**77**	1,603	0	**1,603**	**1,680**
TOTAL	**1,039**	**22,120**	**23,159**	**803,065**	**47,524**	**69,233**	**116,758**	**919,823**

* Others include the Office of Civilian Radioactive Waste Management, Energy Efficiency and Renewable Energy, Office of Fossil Energy, and Office of Nonproliferation and National Security.

Table A-10
1999 DOE Recycling Activities by Site*
(in Metric Tons)

Site	Paper Products	Metals†	Automotive	Other††	TOTAL †††
Sandia National Laboratories/New Mexico	453	1,247	64	7,659	9,423
Idaho National Engineering and Environmental Laboratory	37	7,483	56	1,203	8,779
Oak Ridge Y-12 Plant	298	693	113	6,805	7,909
Oak Ridge National Laboratory	302	359	27	2,340	3,027
Lawrence Livermore National Laboratory	506	2,028	36	3,616§	6,186
Argonne National Laboratory - East	435	1,091	29	3,293	4,847
East Tennessee Technology Park	187	3,091	30	784	4,092
Western Area Power Administration	111	560	37	3,288	3,996
Savannah River Site	707	1,051	4	1,536	3,297
Rocky Flats Environmental Technology Site	370	1,252	29	1,304	2,955
Energy Technology Engineering Center	5	456	0	2,381	2,841
Kansas City Plant	123	625	19	1,601	2,368
Los Alamos National Laboratory	510	640	93	758	2,000
Fernald Environmental Management Project	132	1,716	0	10	1,857
Strategic Petroleum Reserve Project Management Office	59	753	19	770	1,601
Hanford Site	476	600	85	311	1,472
Fermi National Accelerator Laboratory	0	1,156	13	45	1,214
Nevada Test Site	312	717	45	112	1,186
West Valley Demonstration Project	130	388	3	526	1,047
Brookhaven National Laboratory	449	53	28	334	863
Stanford Linear Accelerator Center	138	442	2	104	685
Portsmouth Gaseous Diffusion Plant	19	112	4	336	471
Miamisburg Environmental Management Project	7	454	5	0	467
Princeton Plasma Physics Laboratory	48	319	2	27	396
Pantex Plant	5	257	67	33	362
Yucca Mountain Site Characterization Office	255	1	35	2	292
Argonne National Laboratory - West	76	90	4	54	223
Waste Isolation Pilot Plant	175	13	11	3	201
Pacific Northwest National Laboratory	154	1	3	39	198
Columbus Environmental Management Project	0	153	1	44	198
Federal Energy Technology Center - Pittsburgh	111	56	4	7	178
Sandia National Laboratories/California	52	15	4	19	90
Thomas Jefferson National Accelerator Facility	0	38	<0.5	40	78
Albany Research Center	23	51	<0.5	1	76
Ames Laboratory	25	47	<0.5	<0.5	72
Grand Junction Projects Office	39	<0.5	<0.5	<0.5	40
Oak Ridge Institute for Science and Education	34	4	1	<0.5	40
Ashtabula Environmental Management Project	1	37	<0.5	<0.5	38
Southwestern Power Administration	<0.5	8	4	<0.5	12
Paducah Gaseous Diffusion Plant	4	<0.5	0	0	4
Southeastern Power Administration	3	<0.5	0	<0.5	3
Office of Scientific and Technical Information	<0.5	0	0	0	<0.5
TOTAL	**6,769**	**28,056**	**874**	**39,386**	**75,084**

Table A-10 (Continued)
1999 DOE Recycling Activities by Site*
(in Metric Tons)

* No recycling data reported by the Environmental Measurements Laboratory and Lawrence Berkeley National Laboratory.

† Scrap metal, precious metal, and aluminum can quantities are added together in the "metals" column.

†† Other materials may also include: plastic, styrofoam, glass, toner cartridges, food/garden waste, concrete, wood, fluorescent light tubes, coolant, filters, solvents, photographic materials, ground circuit boards, chemicals, small animal exposure tubes, paint adhesives, brick, non-process wastewater, furniture/office equipment, engine coolant, and fly ash.

††† Quantities are estimates that have been rounded to the nearest whole number, assuming that one cubic meter is equivalent to one metric ton. Materials sent offsite for handling to be recycled by another party are not included in these estimates.

§ Excludes 40,876 metric tons of recycled soil used as landfill cover.

Figure A-1
1999 Routine Operations, Cleanup/Stabilization, and Sanitary Waste Generation by Operations/Field Office (in Cubic Meters)

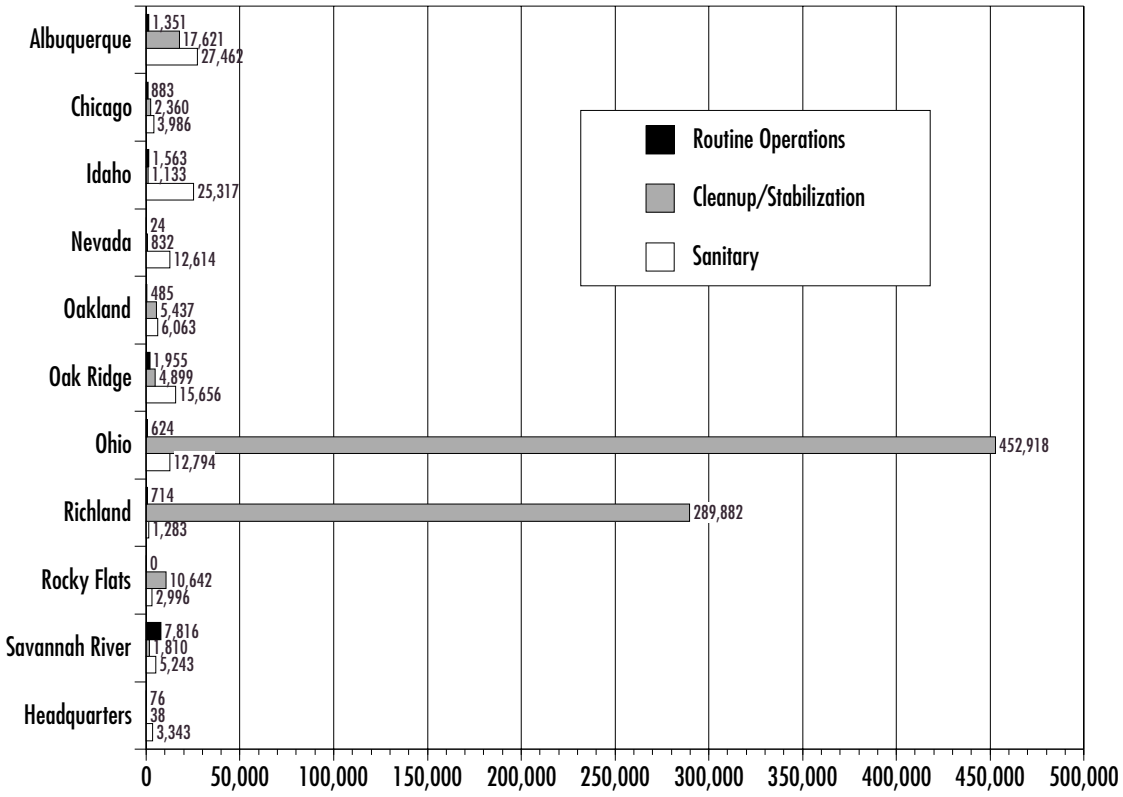
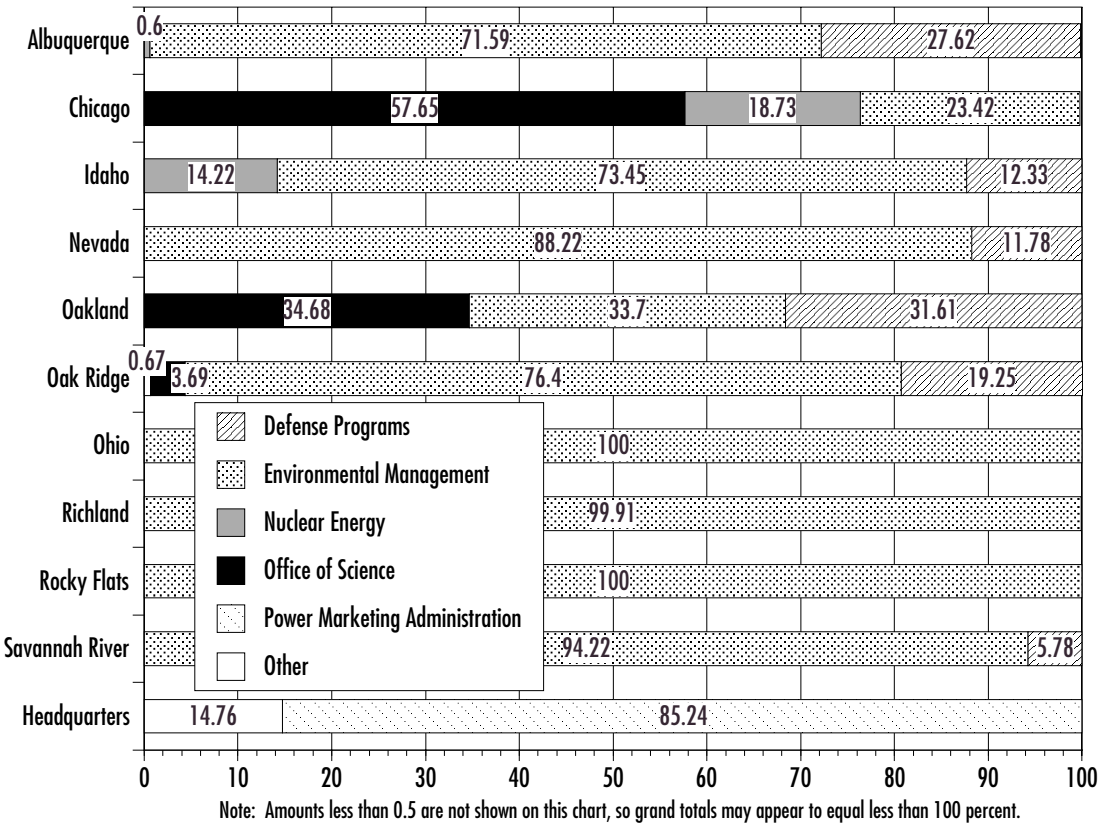


Figure A-2
1999 Program Routine Operations and Cleanup/Stabilization Waste Generation (Excluding Sanitary Waste) by Operations/Field Office (in Percent)



Note: Amounts less than 0.5 are not shown on this chart, so grand totals may appear to equal less than 100 percent.

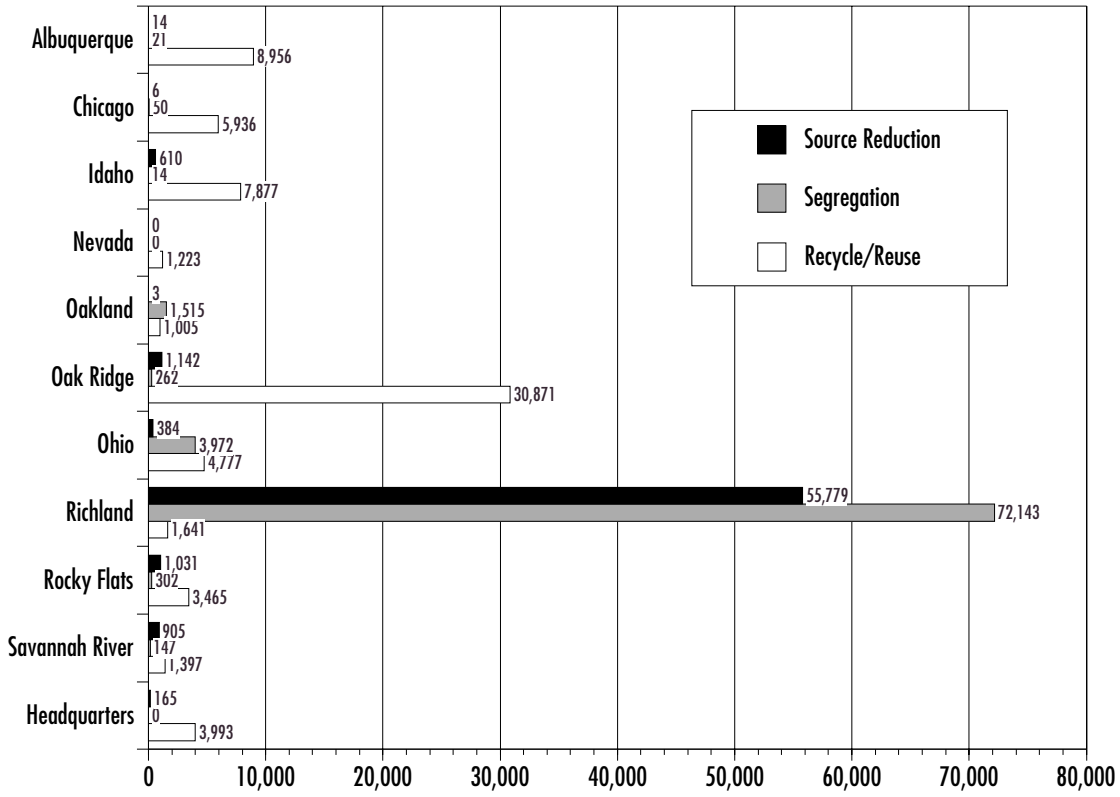


Figure A-3
1999 Waste Reduction from Pollution Prevention Projects by Operations/Field Office (in Metric Tons)

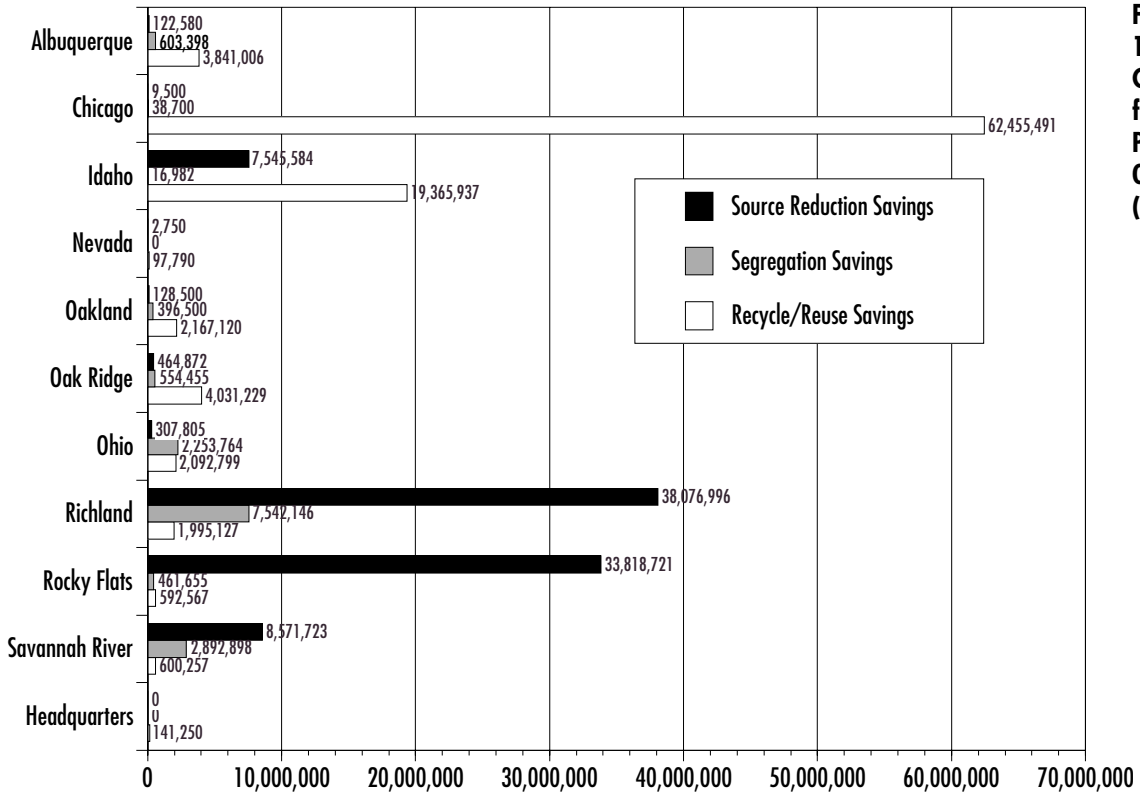
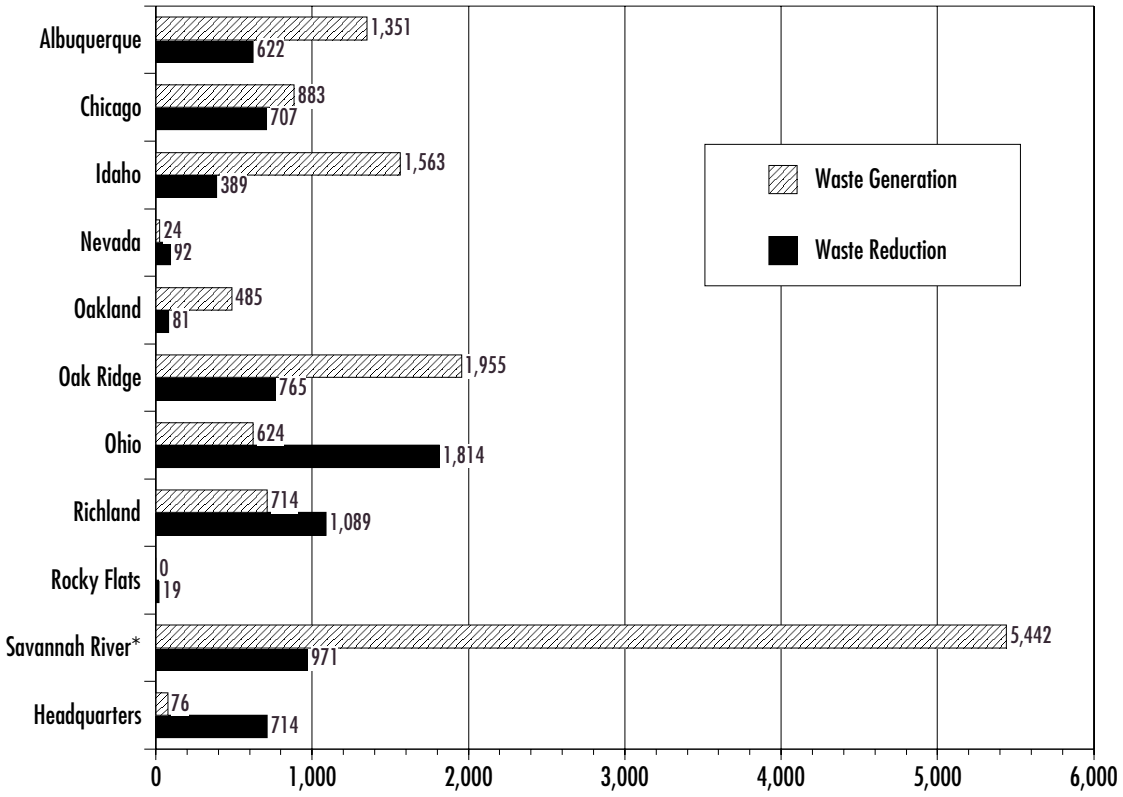


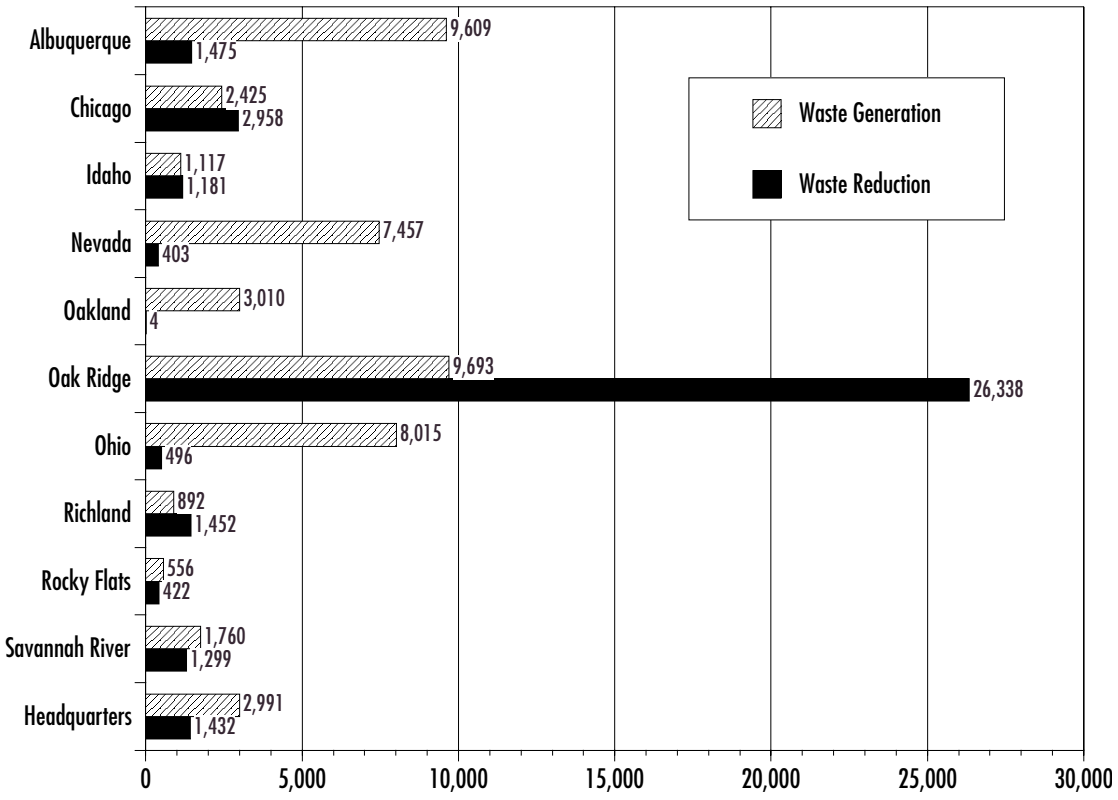
Figure A-4
1999 Total Reported Cost Savings/Avoidance from Pollution Prevention Projects by Operations/Field Office (in Dollars)

Figure A-5
1999 Routine Operations Waste Generation and Waste Reduction (Excluding Sanitary Waste) by Operations/Field Office (in Cubic Meters)



*Not including high-level waste.

Figure A-6
1999 Routine Operations Sanitary Waste Generation and Waste Reduction by Operations/Field Office (in Metric Tons)



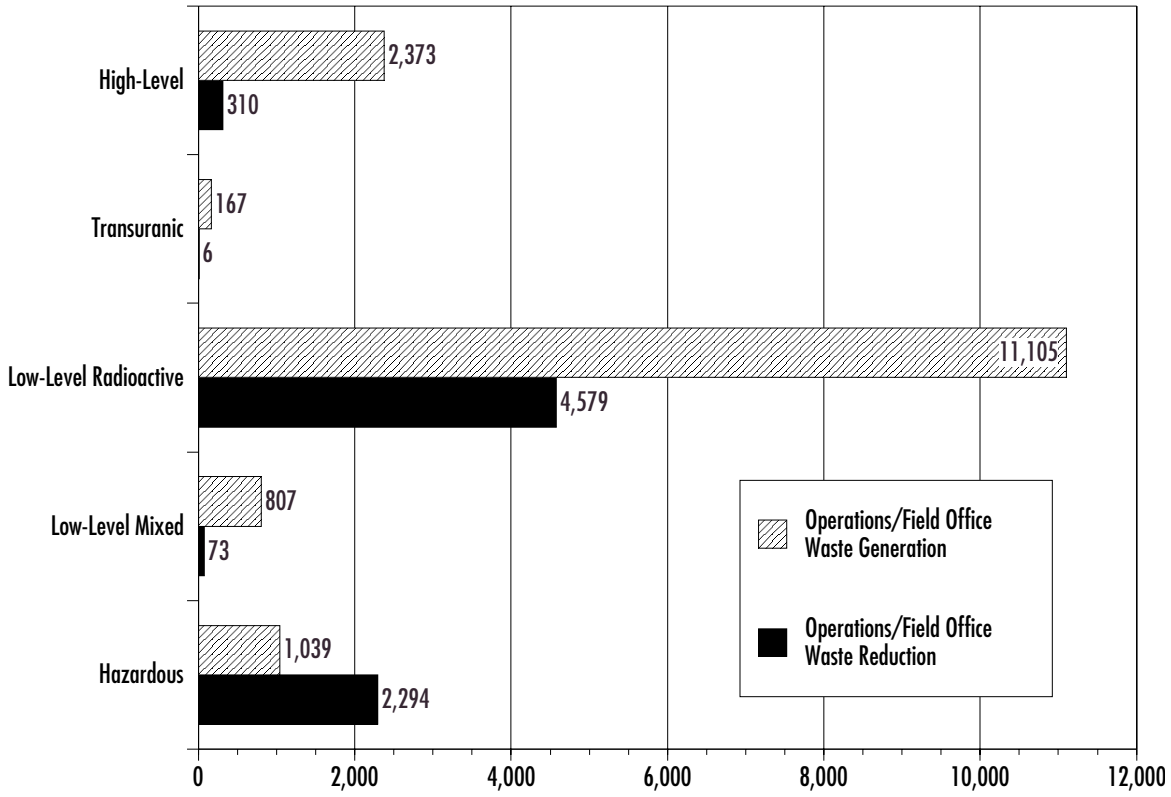


Figure A-7
1999 Routine Operations Waste Generation and Waste Reduction for All Operations/Field Offices by Waste Type (in Cubic Meters)

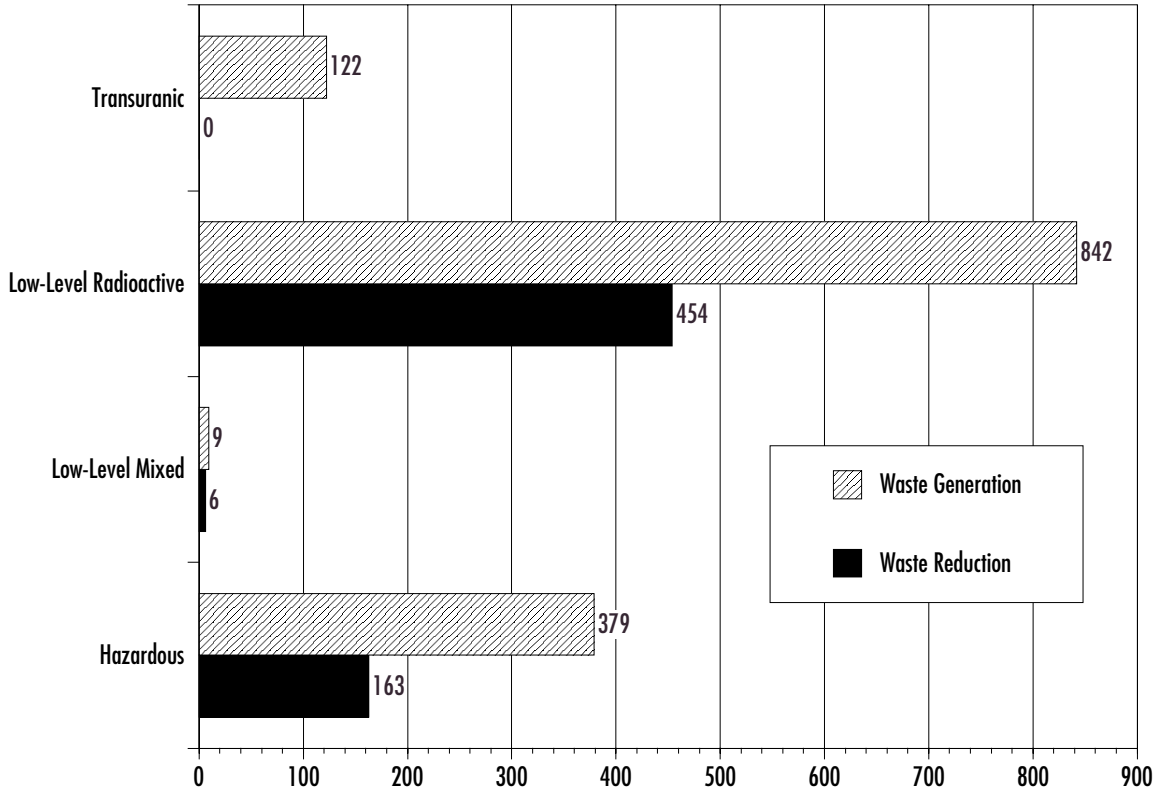


Figure A-8
Albuquerque Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

Figure A-9 Chicago Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

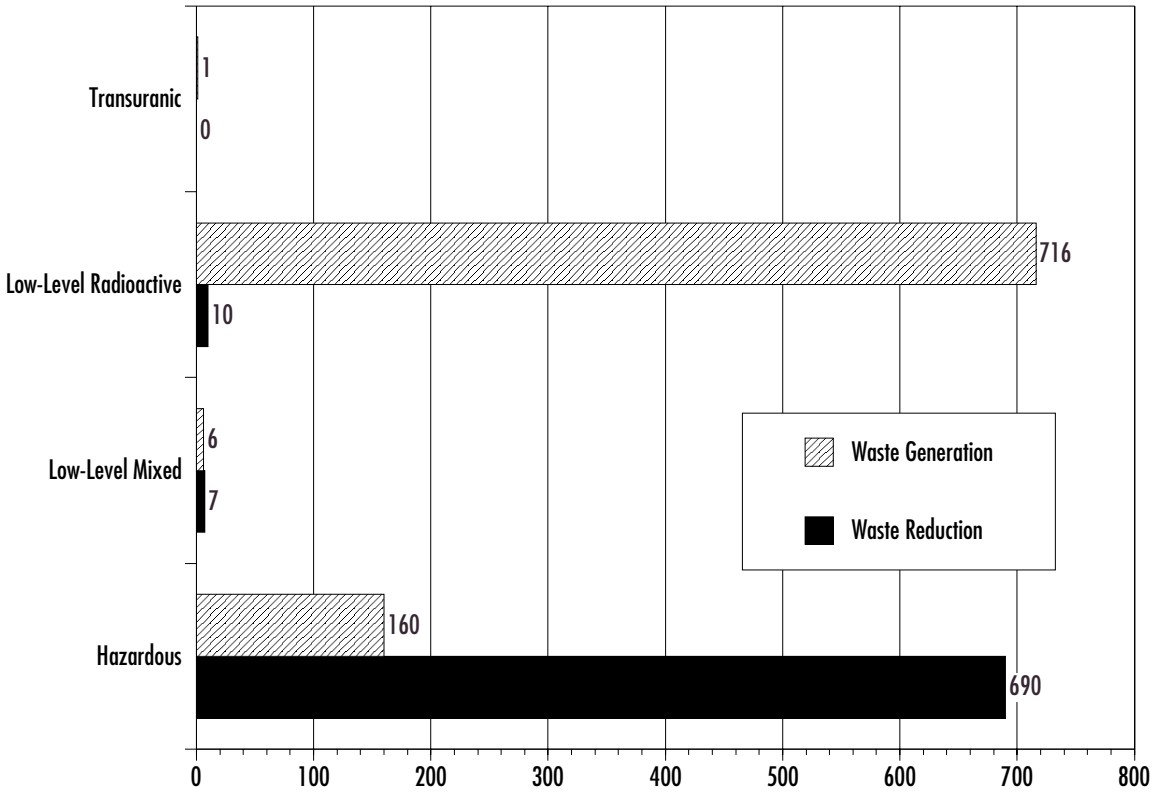
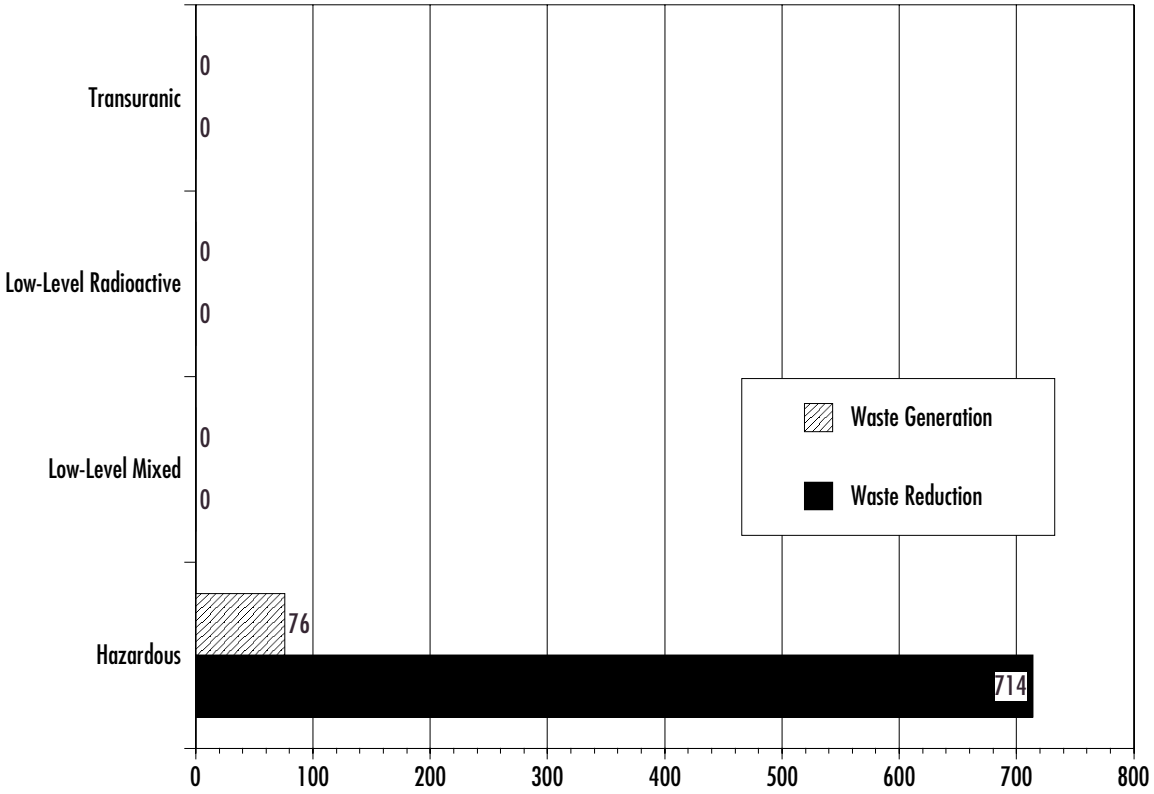


Figure A-10 Headquarters 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)



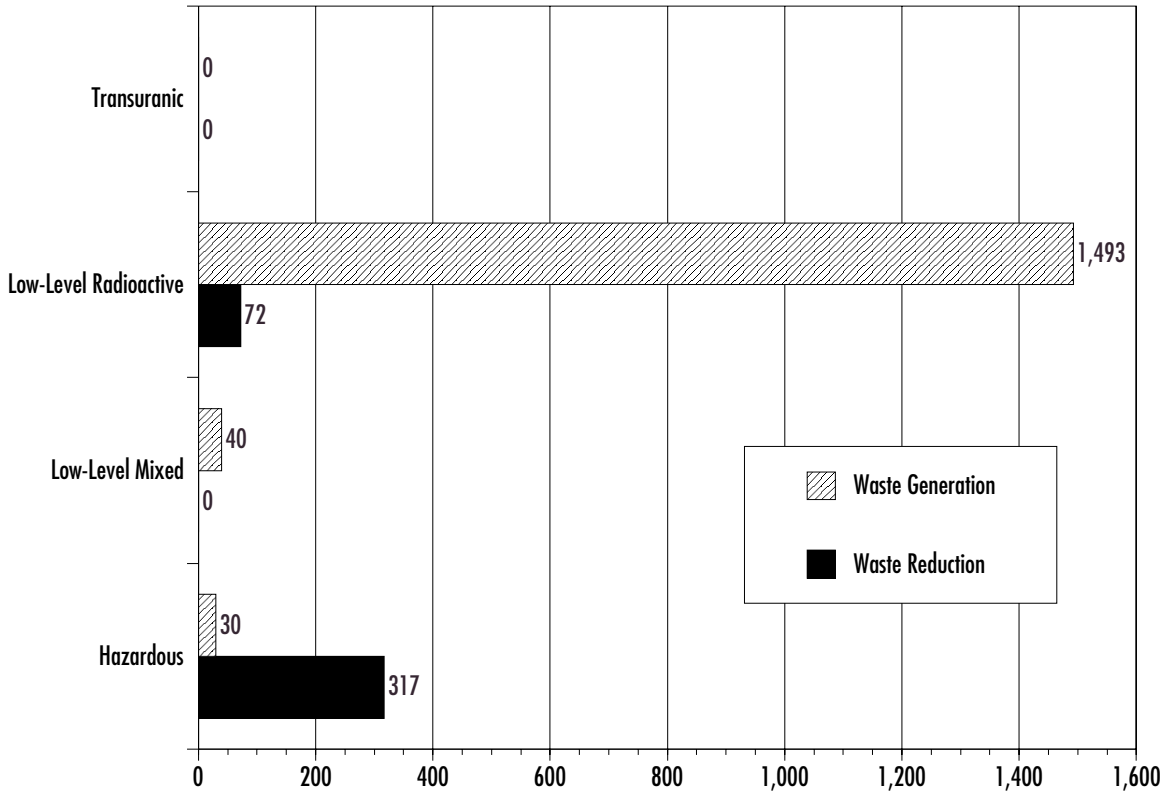


Figure A-11
Idaho Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

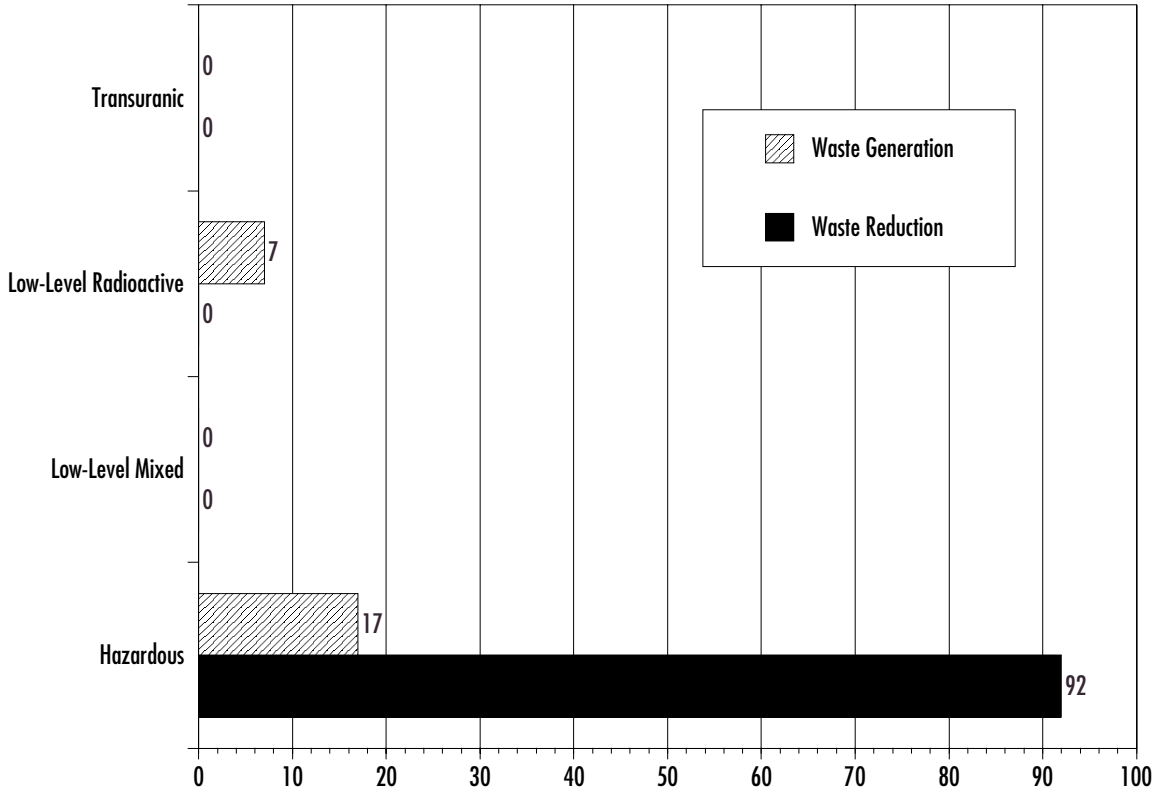


Figure A-12
Nevada Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

Figure A-13
Oakland Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

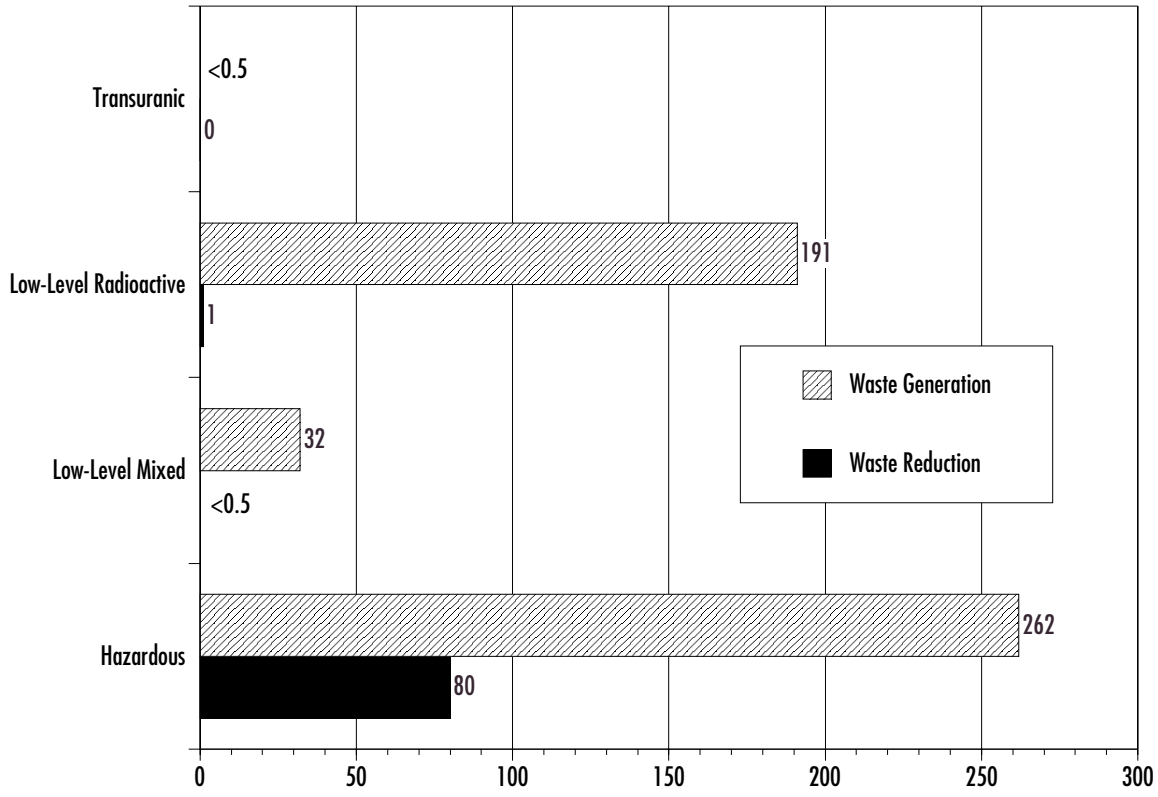
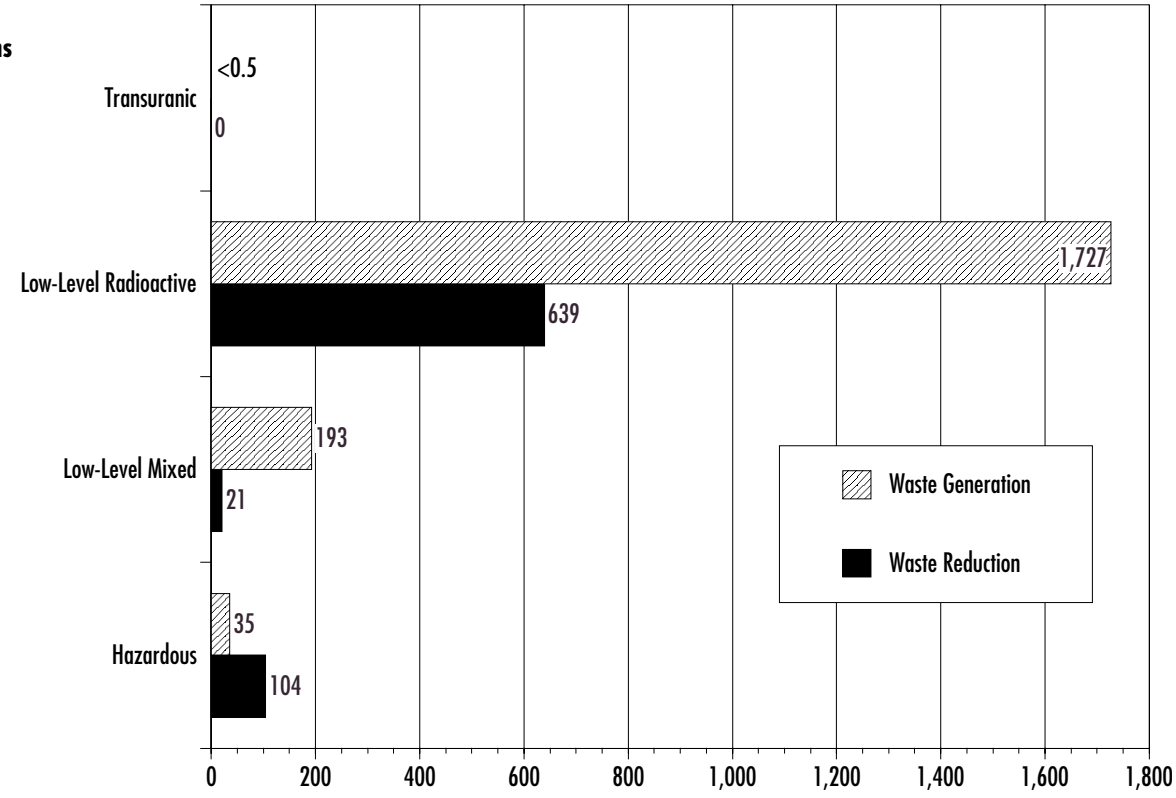


Figure A-14
Oak Ridge Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)



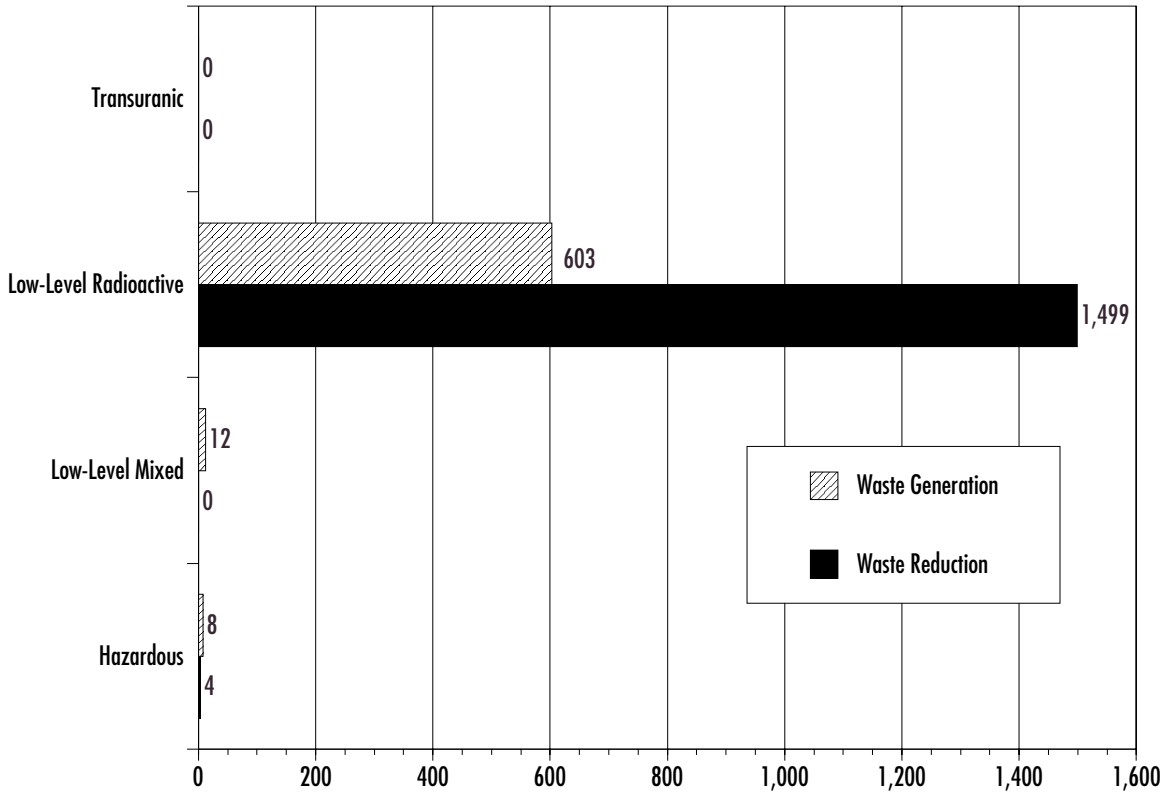


Figure A-15
Ohio Field Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

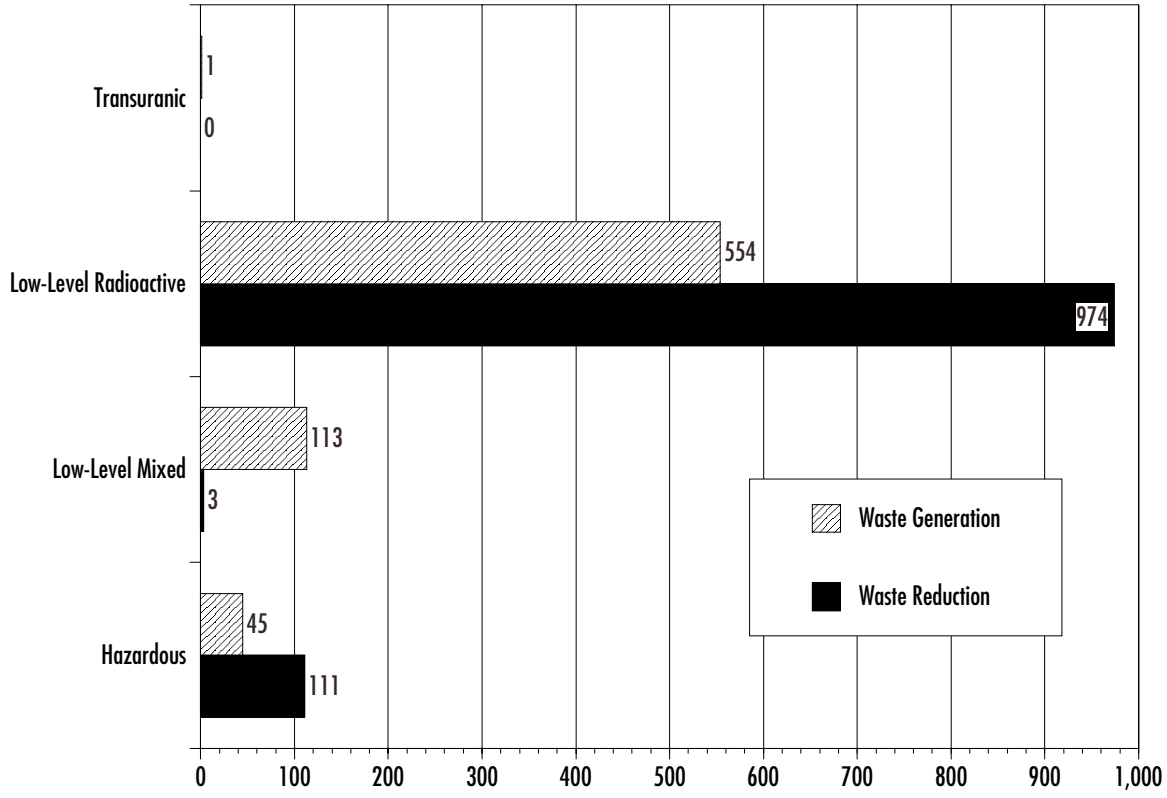


Figure A-16
Richland Operations Office 1999 Routine Operations Waste Generation and Waste Reduction (in Cubic Meters)

Figure A-17
Rocky Flats Field Office
1999 Routine
Operations Waste
Generation and
Waste Reduction
(in Cubic Meters)

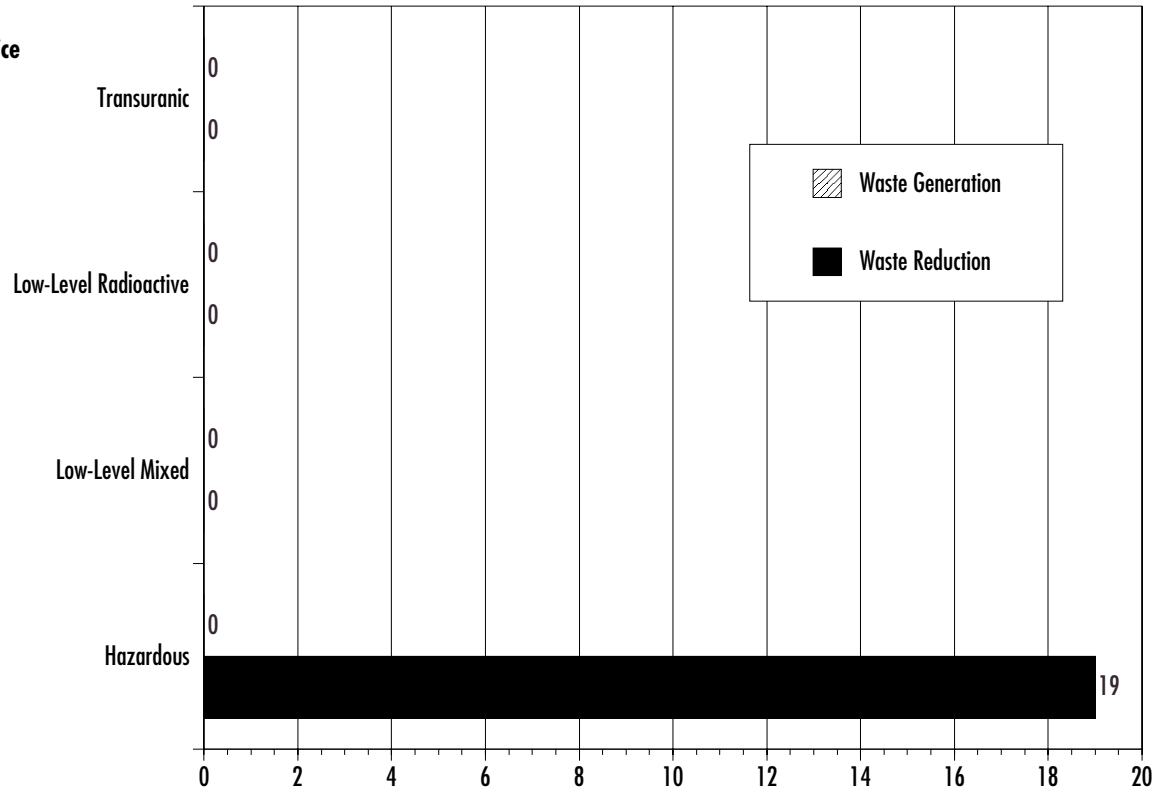
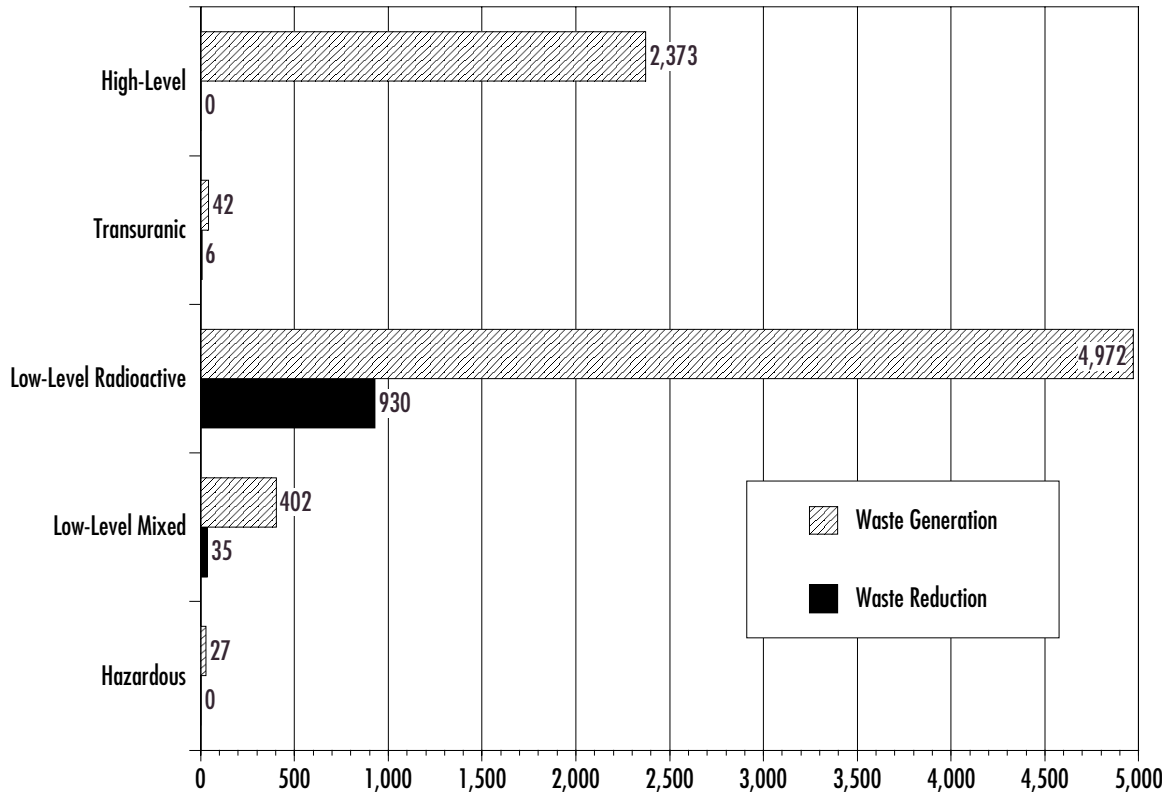


Figure A-18
Savannah River
Operations Office
1999 Routine
Operations Waste
Generation and
Waste Reduction
(in Cubic Meters)



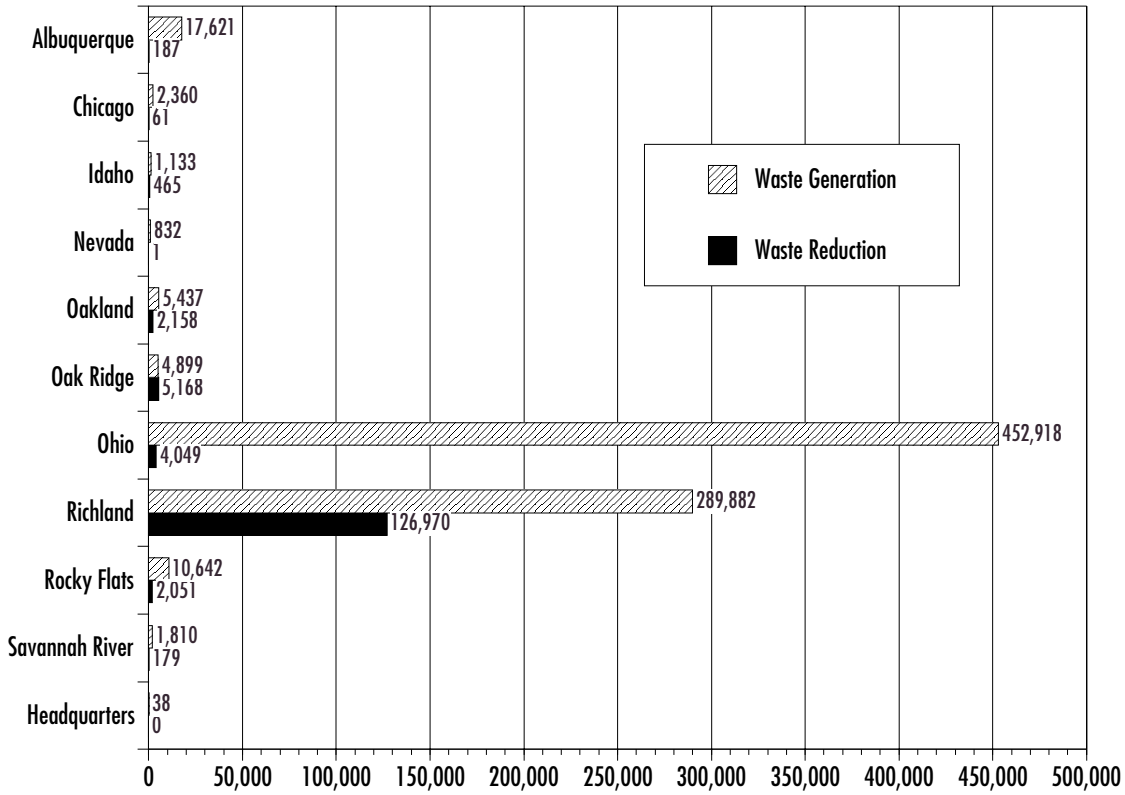


Figure A-19
1999 Cleanup/Stabilization Waste Generation and Waste Reduction (Excluding Sanitary Waste) by Operations/Field Office (in Cubic Meters)

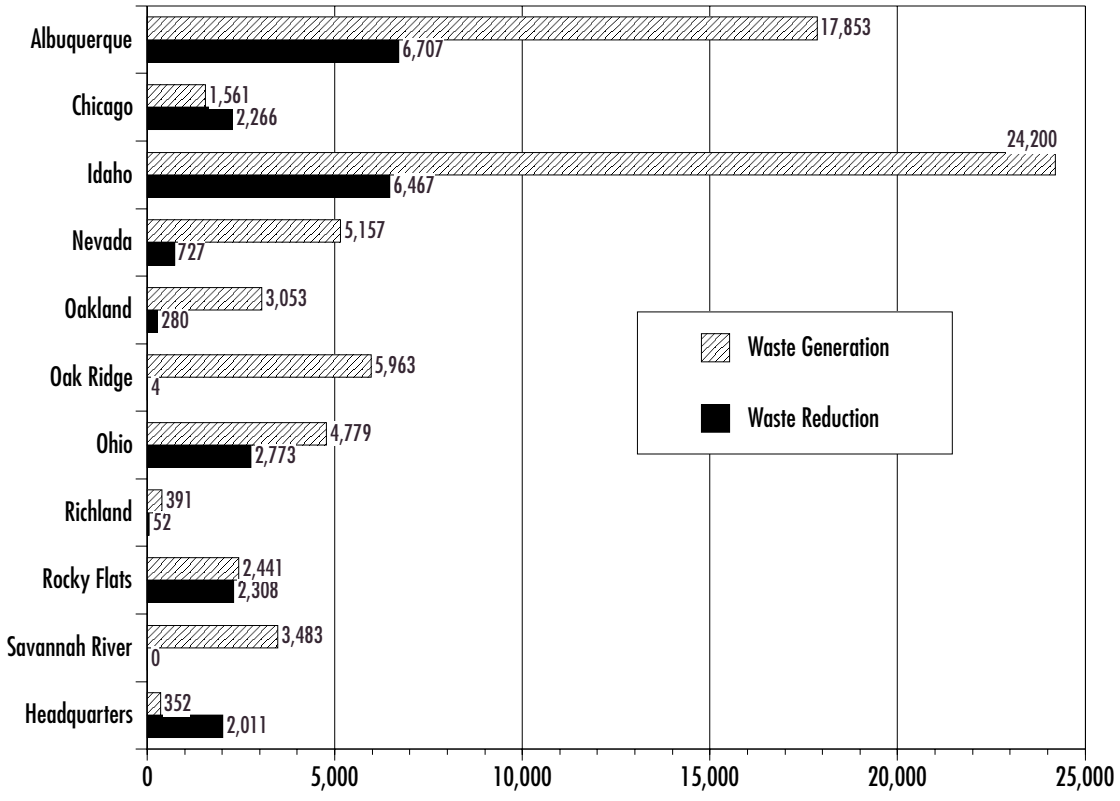


Figure A-20
1999 Cleanup/ Stabilization Sanitary Waste Generation and Waste Reduction by Operations/Field Office (in Metric Tons)

Figure A-21
1999 Cleanup/ Stabilization Waste Generation and Waste Reduction for All Operations/Field Offices by Waste Type (in Cubic Meters)

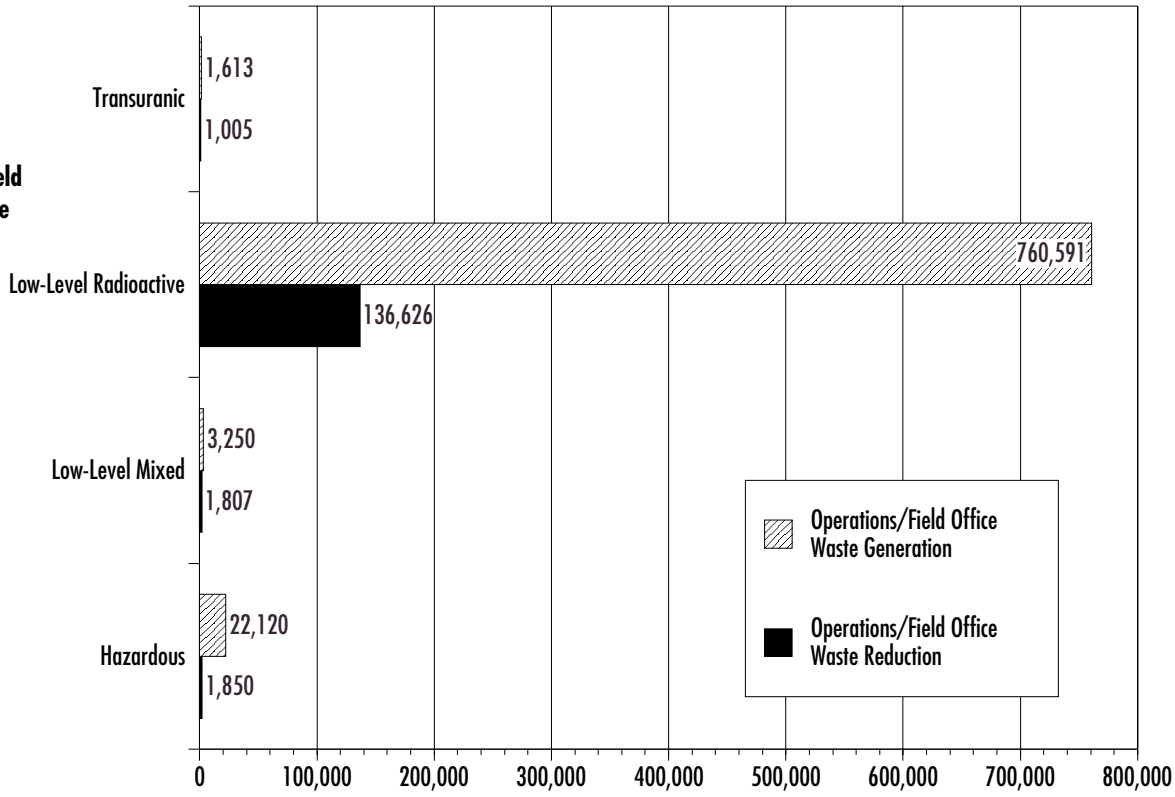
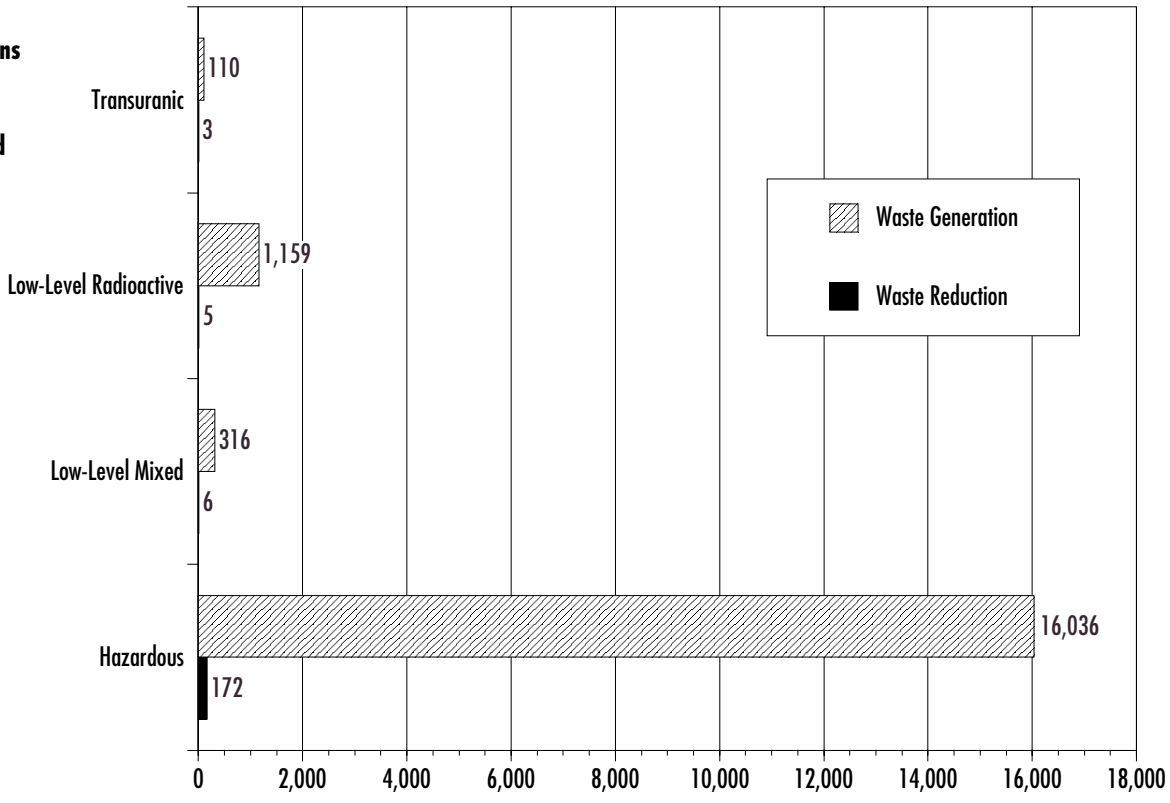


Figure A-22
Albuquerque Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)



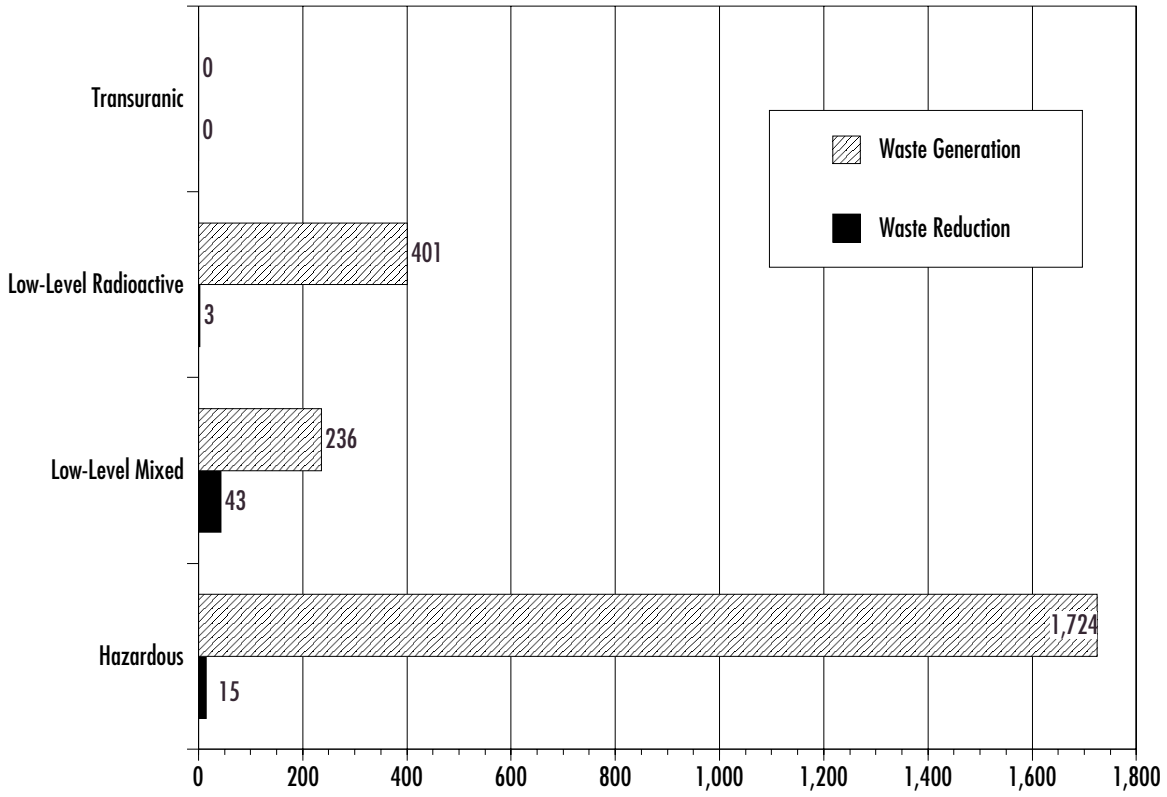


Figure A-23
Chicago Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)

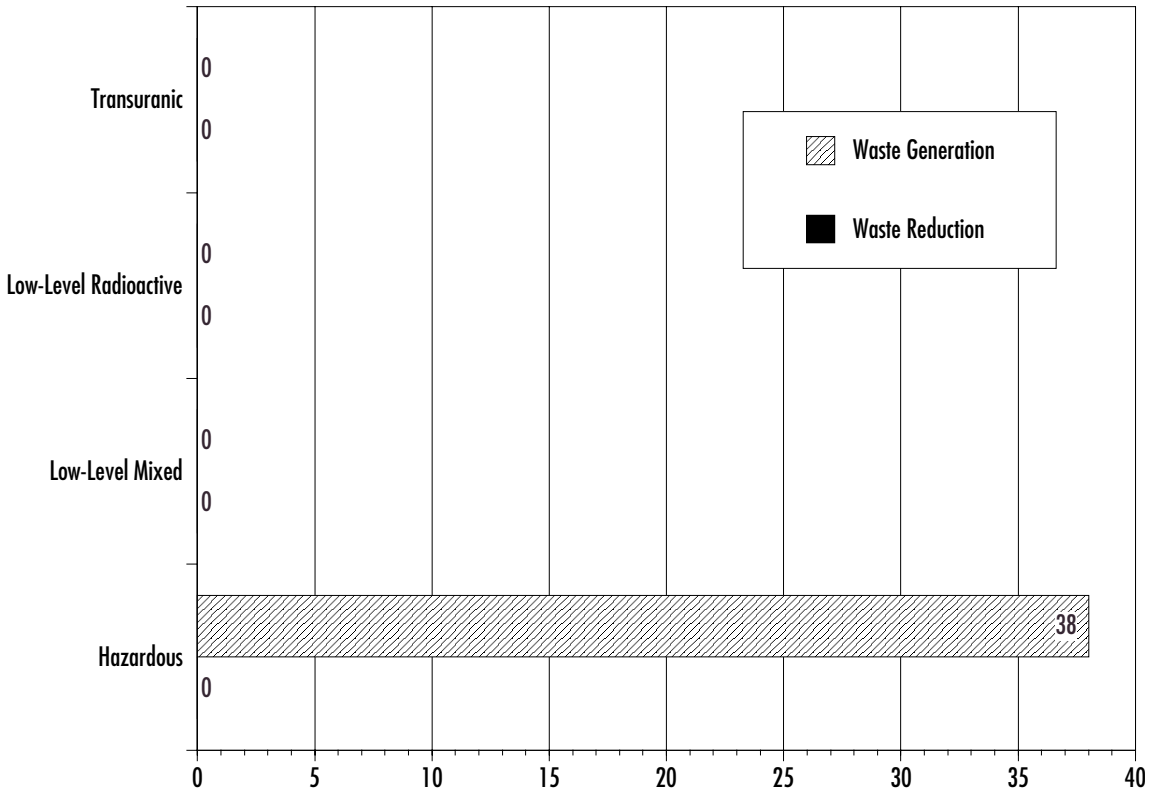


Figure A-24
Headquarters 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)

Figure A-25
Idaho Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)

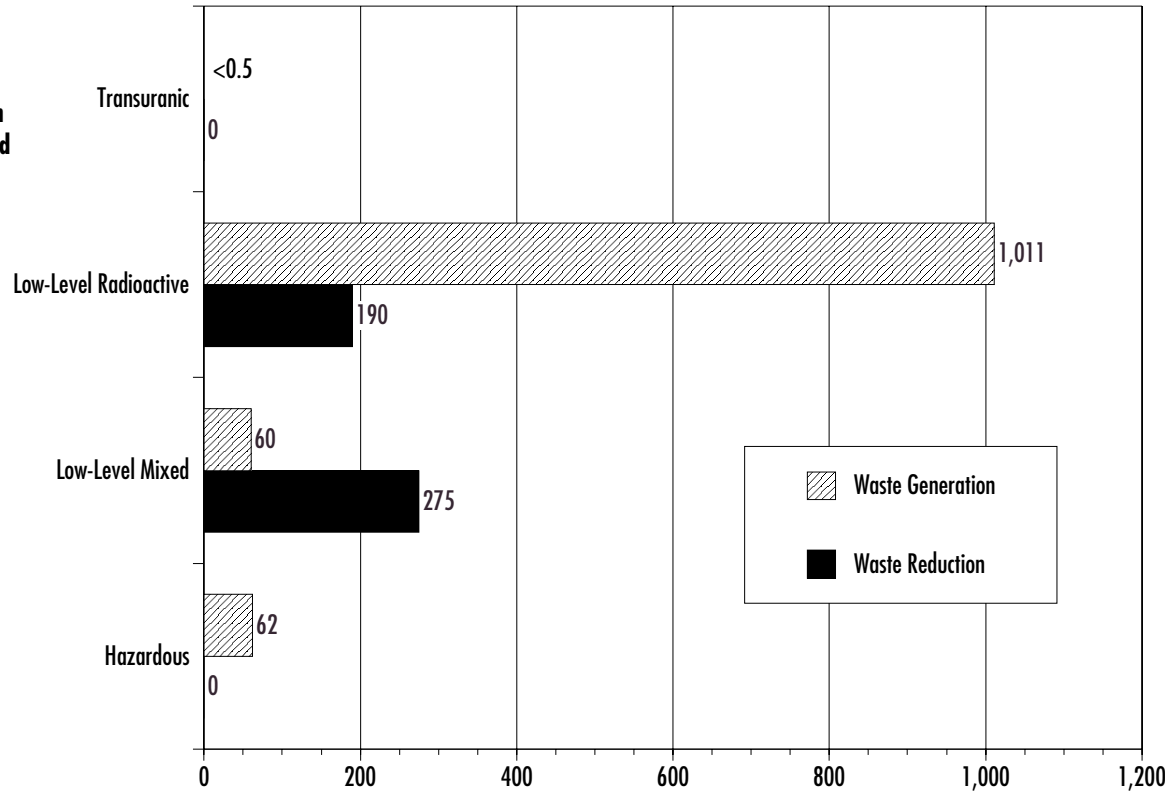
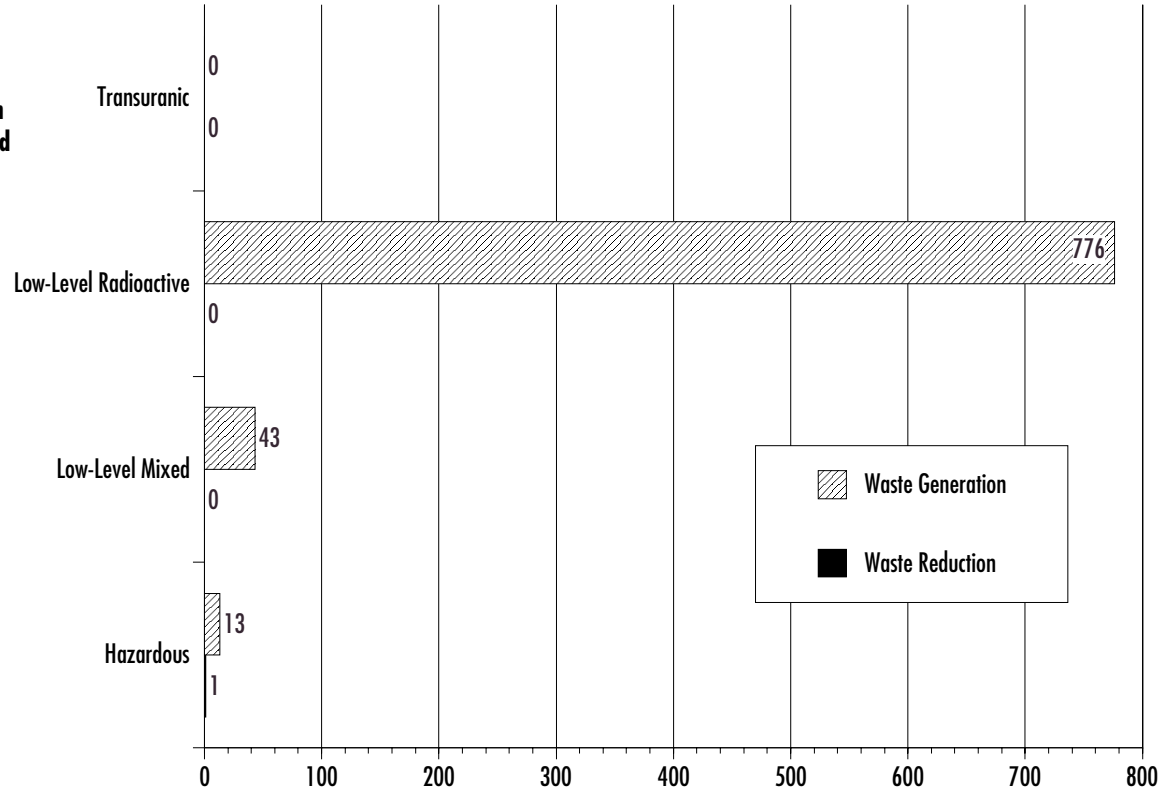


Figure A-26
Nevada Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)



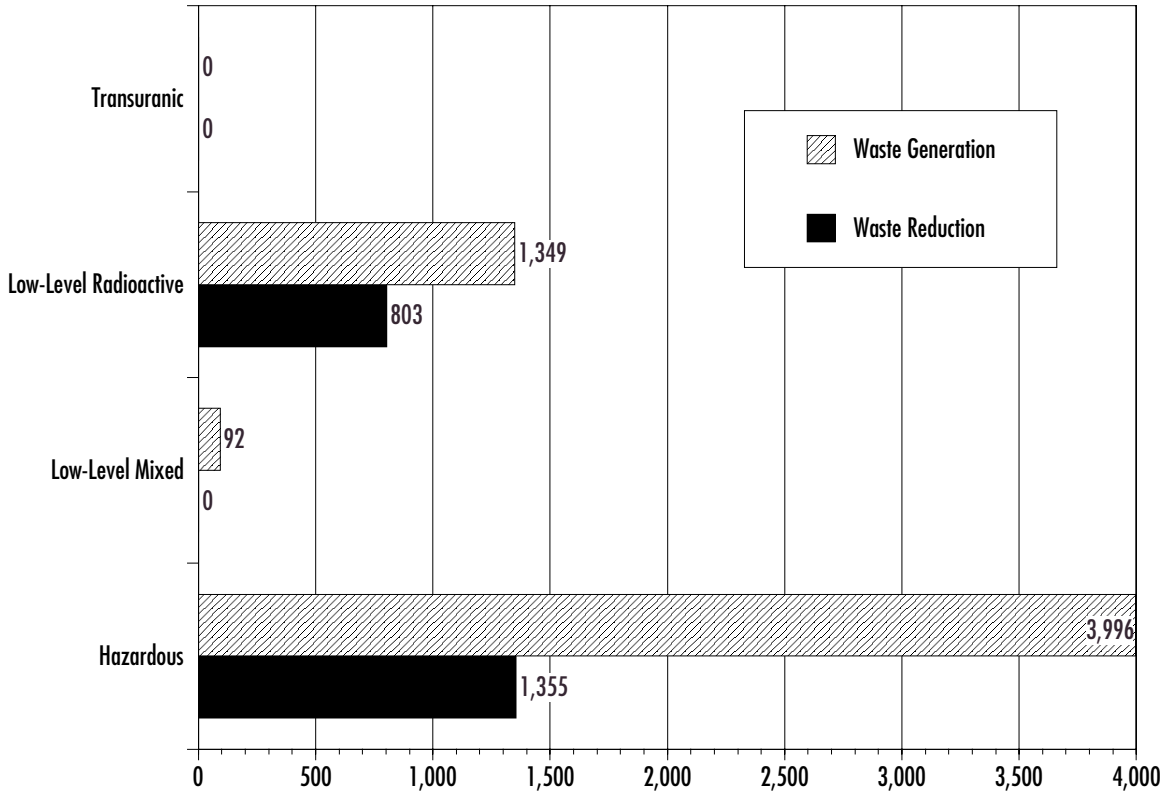


Figure A-27
Oakland Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)

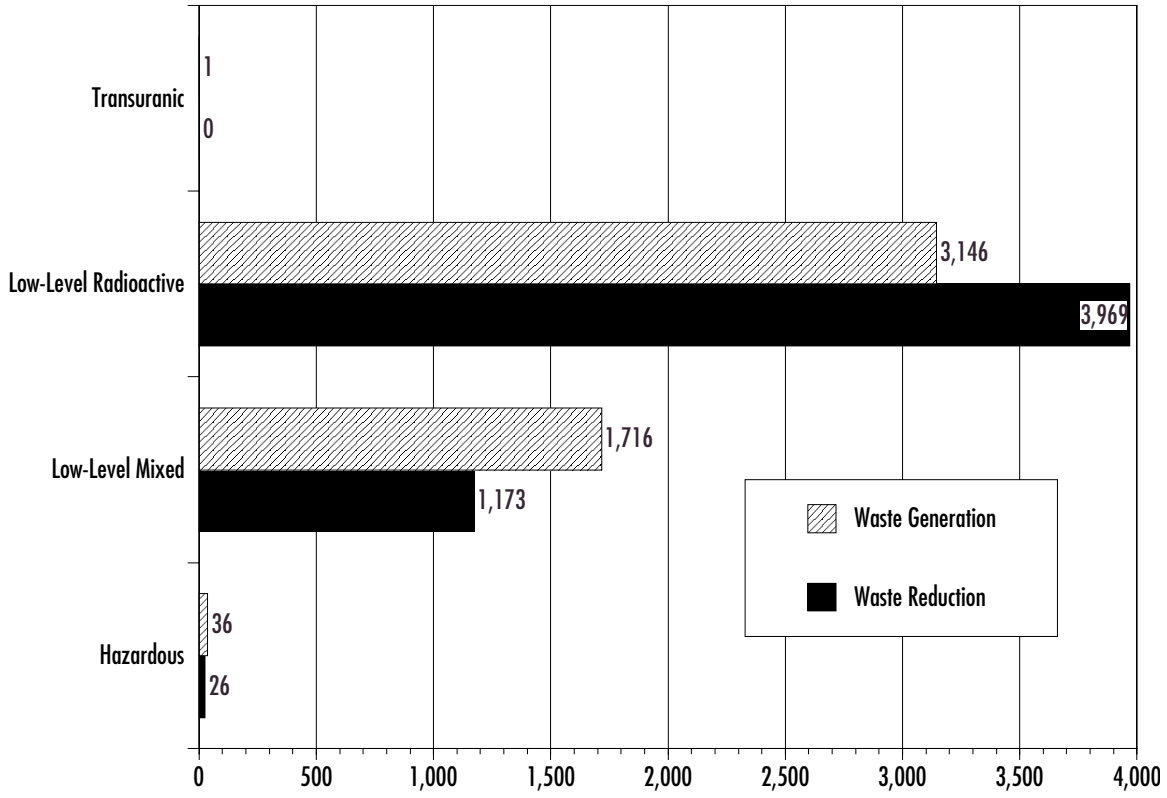


Figure A-28
Oak Ridge Operations Office 1999 Cleanup/Stabilization Waste Generation and Waste Reduction (in Cubic Meters)

Figure A-29
Ohio Field Office
1999 Cleanup/
Stabilization Waste
Generation and
Waste Reduction
(in Cubic Meters)

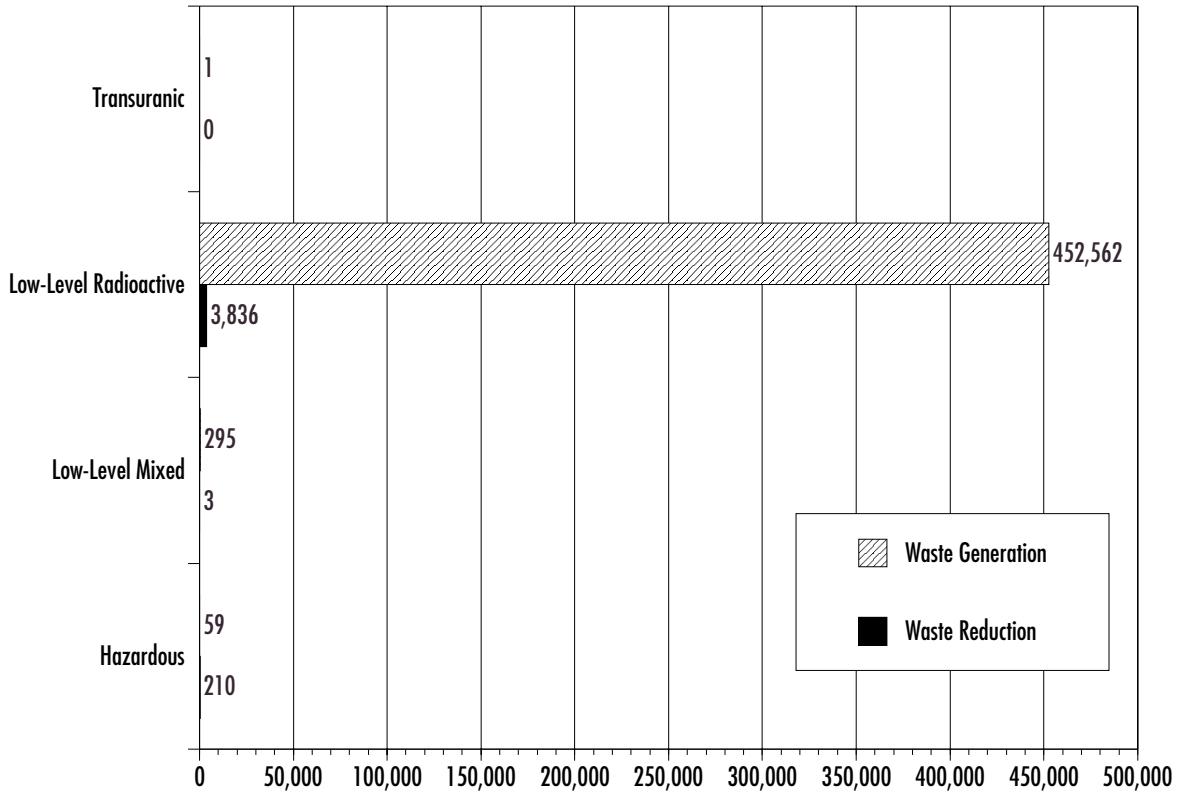
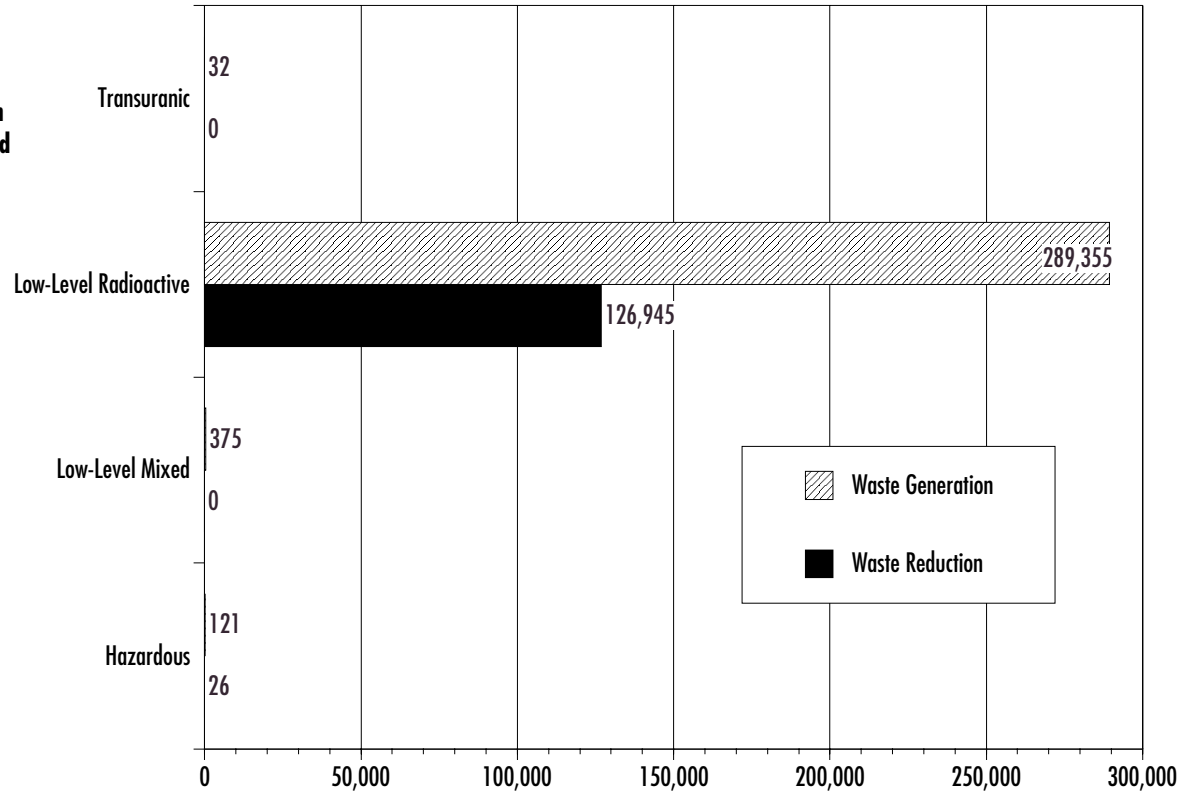


Figure A-30
Richland Operations
Office 1999
Cleanup/Stabilization
Waste Generation and
Waste Reduction
(in Cubic Meters)



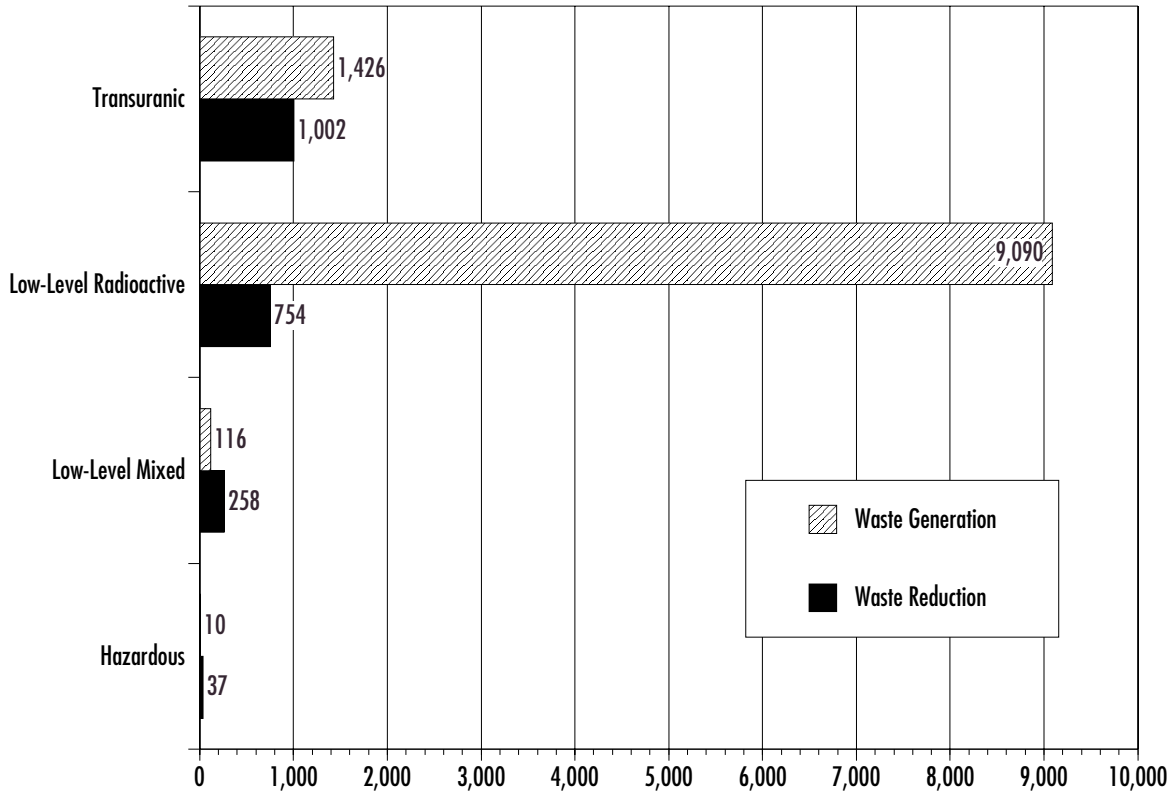


Figure A-31
Rocky Flats Field Office
1999 Cleanup/
Stabilization Waste
Generation and
Waste Reduction
(in Cubic Meters)

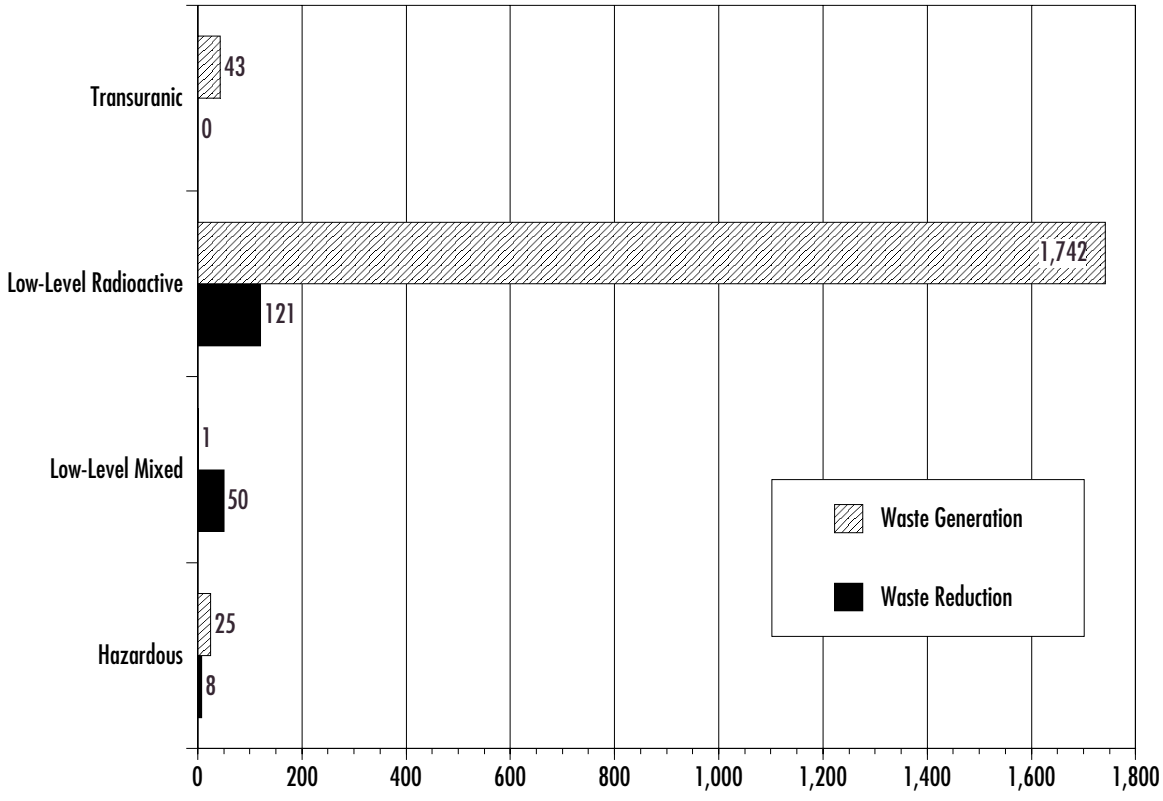


Figure A-32
Savannah River
Operations Office
1999 Cleanup/
Stabilization Waste
Generation and
Waste Reduction
(in Cubic Meters)

Appendix B

Affirmative Procurement

On September 14, 1998, President Clinton issued Executive Order 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, requiring all federal agencies to increase their effort in waste prevention, recycling, and the purchase of environmentally preferable products (also called Affirmative Procurement). Executive Order 13101 supercedes Executive Order 12873, *Federal Acquisition, Recycling and Waste Prevention*, and requires federal agencies to set goals for solid waste prevention and recycling for the years 2000, 2005, and 2010. Federal agencies should also incorporate the recycle/reuse of pallets and the collection of toner cartridges for remanufacturing into their recycling programs, set goals to increase the procurement of products made with recovered materials, and increase the use of environmentally preferable products and services.

Table B-1 consists of a series of tables that present the grand total of DOE's Fiscal Year 1999 Affirmative Procurement purchases, and totals by Operations/Field Office or Program Office. This information is also available on the Executive Order 13101 Web site at **http://twilight.saic.com/ap/sum1999.cfm**.

How To Read Table B-1

Federal agencies are required to purchase certain products with recovered content as designated by the Environmental Protection Agency (EPA). These products are grouped into categories, which are listed in the first column of Table B-1. The second column, "Total," lists the total dollar value of the Fiscal Year 1999 purchases of these products. The third column, "With Recovered Content," lists the total dollar value of the Fiscal Year 1999 purchases of products with recovered content. The fourth column, "Percent With Recovered Content," represents the percentage of the total purchases with recovered content (calculated by dividing column three by column two, then multiplying by 100).

The EPA allows federal agencies to exclude from the total purchases those purchases where a product with recovered content was not available competitively at a reasonable price, or did not meet performance standards. Column five, "Adjusted Total," lists the total dollar value of the Fiscal Year 1999 purchases **excluding** purchases where a product with recovered content was not available competitively at a reasonable price, or did not meet performance standards. Column six, "Adjusted Percent With Recovered Content," lists the Affirmative Procurement purchase percentage achieved for Fiscal Year 1999 (calculated by dividing column three by column five, then multiplying by 100).

Table B-1
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Grand Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	$8,805,126	$4,582,739	52%	$5,223,793	88%
Landscaping Products	$9,601	$1,792	19%	$2,209	81%
Non-Paper Office	$7,596,547	$4,332,426	57%	$5,294,222	82%
Paper Products	$12,347,413	$9,345,366	76%	$10,696,369	87%
Transportation Products	$26,864	$23,437	87%	$23,686	99%
Vehicular Products	$1,927,991	$249,746	13%	$434,134	58%
Park Products	$3,777	$2,362	63%	$2,362	100%
Miscellaneous Products	$217,808	$55,878	26%	$82,967	67%
GRAND TOTALS	**$30,935,127**	**$18,593,746**	**60%**	**$21,759,742**	**85%**

Albuquerque Totals

Construction Products	$1,837,645	$1,196,933	65%	$1,246,977	96%
Landscaping Products	$1,451	$1,392	96%	$1,392	100%
Non-Paper Office	$1,760,994	$652,674	37%	$1,123,565	58%
Paper Products	$3,013,372	$1,858,385	62%	$2,488,818	75%
Transportation Products	$2,136	—	0%	—	NA
Vehicular Products	$123,263	$27,486	22%	$48,833	56%
Park Products	$2,496	$1,159	46%	$1,159	100%
Miscellaneous Products	$32,301	$6,364	20%	$31,017	21%
ALBUQUERQUE TOTALS	**$6,773,657**	**$3,744,393**	**55%**	**$4,941,761**	**76%**

Chicago Totals

Construction Products	$146,622	$141,546	97%	$141,546	100%
Landscaping Products	$453	—	0%	—	NA
Non-Paper Office	$615,097	$306,963	50%	$320,947	96%
Paper Products	$704,292	$538,233	76%	$542,910	99%
Transportation Products	$1,042	—	0%	—	NA
Vehicular Products	$115,830	$23,064	20%	$82,471	28%
Park Products	$78	—	0%	—	NA
Miscellaneous Products	$9,651	$7,900	82%	$7,900	100%
CHICAGO TOTALS	**$1,593,066**	**$1,017,706**	**64%**	**$1,095,774**	**93%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Table B-1 (Continued)
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Energy Efficiency Regional Office Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	—	—	NA	—	NA
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$6,397	$3,745	59%	$4,019	93%
Paper Products	$13,607	$2,964	22%	$4,210	70%
Transportation Products	—	—	NA	—	NA
Vehicular Products	—	—	NA	—	NA
Park Products	—	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
ENERGY EFFICIENCY REGIONAL OFFICE TOTALS	**$20,004**	**$6,709**	**34%**	**$8,229**	**82%**

Fossil Energy Totals

Construction Products	$16,923	$10,900	64%	$14,651	74%
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$27,570	$22,067	80%	$26,135	84%
Paper Products	$65,602	$13,560	21%	$22,102	61%
Transportation Products	$3,637	$3,405	94%	$3,637	94%
Vehicular Products	$17,915	—	0%	$18,185	NA
Park Products	—	—	NA	—	NA
Miscellaneous Products	$1,776	—	NA	$1,776	NA
FOSSIL ENERGY TOTALS	**$133,424**	**$49,932**	**38%**	**$86,486**	**59%**

Golden Field Office Totals

Construction Products	$89,000	$8,900	10%	$89,000	10%
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$30,568	$30,318	99%	$30,568	99%
Paper Products	$68,400	$64,700	95%	$65,300	99%
Transportation Products	—	—	NA	—	NA
Vehicular Products	—	—	NA	—	NA
Park Products	—	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
GOLDEN FIELD OFFICE TOTALS	**$187,968**	**$103,918**	**55%**	**$184,868**	**56%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Table B-1 (Continued)
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Idaho Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	$44,861	$37,648	84%	$37,648	100%
Landscaping Products	$1,255	—	0%	—	NA
Non-Paper Office	$242,262	$192,701	80%	$192,701	100%
Paper Products	$586,228	$445,394	76%	$445,394	100%
Transportation Products	$823	$823	100%	$823	100%
Vehicular Products	$16,935	$2,243	13%	$2,243	100%
Park Products	—	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
IDAHO TOTALS	**$892,363**	**$678,810**	**76%**	**$678,809**	**100%**

Naval Reactors Totals

Construction Products	$203,137	$16,960	8%	$16,960	100%
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$520,498	$500,729	96%	$500,729	100%
Paper Products	$629,899	$600,766	95%	$600,766	100%
Transportation Products	$1,201	$1,201	100%	$1,201	100%
Vehicular Products	$8,723	$7,513	86%	$7,620	99%
Park Products	—	—	NA	—	NA
Miscellaneous Products	$18,821	$18,821	100%	$18,821	100%
NAVAL REACTORS TOTALS	**$1,382,279**	**$1,145,990**	**83%**	**$1,146,097**	**100%**

Nevada Totals

Construction Products	$2,677	—	0%	—	NA
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$177,715	$63,064	35%	$63,064	100%
Paper Products	$369,454	$297,938	81%	$297,938	100%
Transportation Products	—	—	NA	—	NA
Vehicular Products	$239,846	$41,169	17%	$41,169	100%
Park Products	—	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
NEVADA TOTALS	**$789,692**	**$402,171**	**51%**	**$402,171**	**100%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Table B-1 (Continued)
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Oakland Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	$4,262,351	$1,962,458	46%	$2,251,593	87%
Landscaping Products	$5,624	—	0%	—	NA
Non-Paper Office	$868,335	$434,419	50%	$517,007	84%
Paper Products	$1,993,987	$1,430,820	72%	$1,681,174	85%
Transportation Products	$7,500	$7,500	100%	$7,500	100%
Vehicular Products	$134,235	$12,794	10%	$12,794	100%
Park Products	—	—	NA	—	NA
Miscellaneous Products	$27,068	$15,300	57%	$15,300	100%
OAKLAND TOTALS	**$7,299,100**	**$3,863,291**	**53%**	**$4,485,368**	**86%**

Oak Ridge Totals

Construction Products	$349,437	$327,775	94%	$330,710	99%
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$728,905	$339,153	47%	$573,811	59%
Paper Products	$1,994,266	$1,388,721	70%	$1,812,660	77%
Transportation Products	—	—	NA	—	NA
Vehicular Products	$236,819	$14,178	6%	$55,233	26%
Park Products	—	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
OAK RIDGE TOTALS	**$3,309,427**	**$2,069,826**	**63%**	**$2,772,414**	**75%**

Ohio Totals

Construction Products	$54,741	$54,741	100%	$54,741	100%
Landscaping Products	$400	$400	100%	$400	100%
Non-Paper Office	$264,716	$230,173	87%	$230,173	100%
Paper Products	$628,881	$599,741	95%	$599,741	100%
Transportation Products	$112	$112	100%	$112	100%
Vehicular Products	$36,949	$6,139	17%	$6,139	100%
Park Products	$1,203	$1,203	100%	$1,203	100%
Miscellaneous Products	$4,637	$4,637	100%	$4,637	100%
OHIO TOTALS	**$991,639**	**$897,145**	**90%**	**$897,145**	**100%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Table B-1 (Continued)
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Power Administration Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	$1,210,825	$575,898	48%	$757,700	76%
Landscaping Products	$97	—	0%	$97	NA
Non-Paper Office	$243,426	$28,730	12%	$31,023	93%
Paper Products	$129,394	$124,728	96%	$127,394	98%
Transportation Products	$17	—	0%	$17	NA
Vehicular Products	$63,214	$1,561	2%	$21,641	7%
Park Products	—	—	NA	—	NA
Miscellaneous Products	$660	—	0%	$660	NA
POWER ADMINISTRATION TOTALS	**$1,647,633**	**$730,917**	**44%**	**$938,532**	**78%**

Richland Totals

Construction Products	$7,311	—	0%	$4,000	NA
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$881,529	$708,008	80%	$715,955	99%
Paper Products	$1,085,362	$996,416	92%	$1,015,563	98%
Transportation Products	$639	$639	100%	$639	100%
Vehicular Products	$239,846	$15,945	14%	$15,945	100%
Park Products	$112,832	—	NA	—	NA
Miscellaneous Products	—	—	NA	—	NA
RICHLAND TOTALS	**$2,087,673**	**$1,721,008**	**82%**	**$1,752,102**	**98%**

Rocky Flats Totals

Construction Products	$15,839	$11,835	75%	$11,835	100%
Landscaping Products	$320	—	0%	$320	NA
Non-Paper Office	$195,851	$84,833	43%	$86,985	98%
Paper Products	$373,795	$365,265	98%	$367,236	99%
Transportation Products	—	—	NA	—	NA
Vehicular Products	$16,000	$16,000	100%	$16,000	100%
Park Products	—	—	NA	—	NA
Miscellaneous Products	$256	$256	100%	$256	100%
ROCKY FLATS TOTALS	**$602,061**	**$478,189**	**79%**	**$482,632**	**99%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Table B-1 (Continued)
DOE Fiscal Year 1999
Affirmative Procurement
Purchases

Savannah River Totals

Category	Total	With Recovered Content	Percent With Recovered Content	Adjusted Total ‡	Adjusted Percent With Recovered Content ‡
Construction Products	$535,757	$237,144	44%	$237,144	100%
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$682,664	$527,475	77%	$527,475	100%
Paper Products	$521,237	$455,527	87%	$455,527	100%
Transportation Products	$9,757	$9,757	100%	$9,757	100%
Vehicular Products	$781,226	$81,654	10%	$81,654	100%
Park Products	—	—	NA	—	NA
Miscellaneous Products	$120,038	—	0%	—	NA
SAVANNAH RIVER TOTALS	**$2,650,679**	**$1,311,557**	**52%**	**$1,311,557**	**100%**

Headquarters Totals

Construction Products	$28,000	—	0%	$28,000	NA
Landscaping Products	—	—	NA	—	NA
Non-Paper Office	$350,020	$207,374	59%	$350,065	59%
Paper Products	$169,636	$162,209	96%	$169,636	96%
Transportation Products	—	—	NA	—	NA
Vehicular Products	$24,205	—	0%	$24,205	NA
Park Products	—	—	NA	—	NA
Miscellaneous Products	$2,600	$2,600	100%	$2,600	100%
HEADQUARTERS TOTALS	**$574,461**	**$372,183**	**65%**	**$574,506**	**65%**

‡ Excludes the purchase of items for which a recycled product was not available at a competitive price or did not meet performance standards.

Appendix C

Point of Contact List

This Appendix provides points of contact for obtaining additional information from DOE Operations/Field Offices and sites/facilities.

POINT OF CONTACT LIST

Operations/Field Office contacts are indicated in bold. Sites that did not report in Calendar Year 1999 are indicated in italics.

Operations Office	Site/Facility Name	Contact Name	E-Mail Address	Telephone	Fax
AL	**Albuquerque Operations Office**	**Mike Sweitzer** **Christina Houston** **Charlie Henn**	**msweitzer@doeal.gov** **chouston@doeal.gov** **chenn@doeal.gov**	**505-845-4347** **505-845-5483** **505-845-4396**	**505-845-6286** **505-845-6286** **505-845-6286**
AL	Grand Junction Projects Office	Larry Arnold Andria Dutcher	larnold@doegjpo.com adutcher@doegjpo.com	970-248-6073 970-248-7656	970-248-6023 970-248-6040
AL	Kansas City Plant	Curtis Roth Bill Schlosberg	croth@kcp.com wschlosberg@kcp.com	816-997-5713 816-997-3673	816-997-7310 816-997-7313
AL	Los Alamos National Laboratory	Joe Vozella Tom Starke Eleanor Chapman	jvozella@doeal.gov tps@lanl.gov eleanorc@lanl.gov	505-665-5027 505-667-6639 505-665-5465	505-665-4872 505-665-8118 505-665-8118
AL	Pantex Plant	Noel Williams Jim Luginbyhl	nwilliam@pantex.com jluginby@pantex.com	806-477-3188 806-477-6507	806-477-6972 806-477-7979
AL	Sandia National Laboratories/CA	Carolyn Holloway Sally Raubfogel	choIloway@doeal.gov sjraubf@sandia.gov	505-845-5248 925-294-2341	505-845-4671 925-294-3418
AL	Sandia National Laboratories/NM	Carolyn Holloway Kylene Molley	choIloway@doeal.gov kjmolle@sandia.gov	505-845-5248 505-284-3982	505-845-4671 505-844-3747
AL	Waste Isolation Pilot Plant	Cindy Zvonar C.L. Woodin	zvonarc@wipp.carlsbad.nm.us woodinc@wipp.carlsbad.nm.us	505-234-7495 505-234-8505	505-234-7008 505-234-8854
CH	**Chicago Operations Office**	**Antanas Bindokas**	**antanas.bindokas@ch.doe.gov**	**630-252-2692**	**630-252-2654**
CH	Ames Laboratory	Dan Kayser	kayser@ameslab.gov	515-294-7923	515-294-2155
CH	Argonne National Laboratory – East	Frank Gines Keith Trychta	frank.gines@ch.doe.gov ktrychta@anl.gov	630-252-4182 630-252-1476	630-252-2361 630-252-3153
CH	Argonne National Laboratory – West	William Bass Adrian Collins	greg.bass@anlw.anl.gov adrian.collins@anlw.anl.gov	208-533-7184 208-533-7643	208-533-7422 208-533-7344
CH	Brookhaven National Laboratory	Caroline Polanish Glen Todzia	polanish@bnl.gov todzia@bnl.gov	516-344-5224 516-344-7488	516-344-3444 516-344-7334
CH	Environmental Measurements Laboratory	Al Crescenzi	alcres@eml.doe.gov	212-620-3571	212-620-3600
CH	Fermi National Accelerator Laboratory	Sally Arnold Rod Walton	sally.arnold@ch.doe.gov rwalton@fnal.gov	630-840-2239 630-840-2565	630-840-3285 630-840-3390

POINT OF CONTACT LIST

Operations/Field Office contacts are indicated in bold. Sites that did not report in Calendar Year 1999 are indicated in italics.

Operations Office	Site/Facility Name	Contact Name	E-Mail Address	Telephone	Fax
CH	New Brunswick Laboratory	Eric Dallmann	eric.dallmann@ch.doe.gov	630-252-3340	630-252-6256
CH	Princeton Plasma Physics Laboratory	Jeffrey Makiel Scott Larson Tom McGeachen	jmakiel@pppl.gov slarson@pppl.gov tmcgeach@pppl.gov	609-243-3721 609-243-3387 609-243-2948	609-243-2032 609-243-3366 609-243-3366
HQ	Albany Research Center	Bert Staples	staples@alrc.doe.gov	541-967-5871	541-967-5936
HQ	Bonneville Power Administration	James Meyer	jrmeyer@bpa.gov	503-230-5038	503-230-7591
HQ	Federal Energy Technology Center (FETC) - Morgantown	Jason M. Cook	jcook@metz.doe.gov	304-285-4718	304-285-4403
HQ	Federal Energy Technology Center (FETC) - Pittsburgh	Bruce Webster	webster@netl.doe.gov	412-386-4475	412-386-4726
HQ	*National Petroleum Technology Office*	*David Alleman*	*dalleman@npto.doe.gov*	*918-337-4455*	*918-337-4418*
HQ	*National Renewable Energy Laboratory*	*Matt Graham* *Randy Ellingson*	*Matt.Graham@nrel.gov* *randy_ellingson@nrel.gov*	*303-275-4766* *303-384-6464*	*303-275-4753* *303-384-6655*
HQ	*Naval Petroleum & Oil Shale Reserves (CO, UT, WY)*	*David Miles*	*dam@casper.net*	*307-437-9631*	*307-437-9623*
HQ	**Pollution Prevention Team, Office of Technical Program Integration, EM-22**	**J. Kent Hancock** **Gregory T. McBrien**	**kent.hancock@em.doe.gov** **gregory.mcbrien@em.doe.gov**	**301-903-1380** **301-903-1385**	**301-903-1398** **301-903-1398**
HQ	Southeastern Power Administration	Herbert Nadler	herbn@sepa.fed.us	706-213-3853	706-213-3884
HQ	Southwestern Power Administration	Joe Malinovsky Bob Orr	malinovsky@swpa.gov orr@swpa.gov	918-595-6667 417-891-2668	918-595-6656 417-891-2693
HQ	Strategic Petroleum Reserve Project Management Office (SPRPMO)	David Brine Mike Huff	david.brine@spr.doe.gov michael.huff@spr.doe.gov	504-734-4277 504-734-4816	504-734-4947 504-734-4070
HQ	Western Area Power Administration	Gene Iley	iley@wapa.gov	970-490-7294	970-490-7579
HQ	Yucca Mountain Site Characterization Office	Scott Wade Kent Wirtz	Scott_Wade@ymp.gov Kent_Wirtz@ymp.gov	702-794-5459 702-295-4980	702-794-5467 702-295-5223
ID	**Idaho Operations Office**	**Charles Ljungberg**	**ljungbc@id.doe.gov**	**208-526-0198**	**208-526-0553**
ID	Idaho National Engineering & Environmental Laboratory	Charles Ljungberg Glade Gilchrist Dave Janke	ljungbc@id.doe.gov ggg@inel.gov jankedh@inel.gov	208-526-0198 208-526-5769 208-526-6327	208-526-0553 208-526-5848 208-526-5514

POINT OF CONTACT LIST

Operations/Field Office contacts are indicated in bold. Sites that did not report in Calendar Year 1999 are indicated in italics.

Operations Office	Site/Facility Name	Contact Name	E-Mail Address	Telephone	Fax
NV	**Nevada Operations Office**	**Carol Shelton**	**shelton@nv.doe.gov**	**702-295-0286**	**701-295-1153**
NV	Nevada Test Site/North Las Vegas Facility	Carol Shelton Alfred Karns	shelton@nv.doe.gov karnsaj@nv.doe.gov	702-295-0286 702-295-5689	701-295-1153 702-295-1420
OAK	**Oakland Operations Office**	**Karin King**	**karin.king@oak.doe.gov**	**510-637-1638**	**510-637-1646**
OAK	Energy Technology Engineering Center	Karin King Satish Shah	karin.king@oak.doe.gov satish.n.shah@boeing.com	510-637-1638 818-586-5007	510-637-1646 818-586-5169
OAK	Lawrence Berkeley National Laboratory	Karin King Shelley Worsham	karin.king@oak.doe.gov saworsham@lbl.gov	510-637-1638 510-486-6123	510-637-1646 510-486-6603
OAK	Lawrence Livermore National Laboratory	Karin King Thomas Kato	karin.king@oak.doe.gov kato3@llnl.gov	510-637-1638 925-422-9642	510-637-1646 925-423-5490
OAK	Stanford Linear Accelerator Center	Karin King Richard Cellamare	karin.king@oak.doe.gov rcellamare@slac.stanford.edu	510-637-1638 650-926-3401	510-637-1646 650-926-3306
OH	**Ohio Field Office**	**Doug Maynor**	**doug.maynor@ohio.doe.gov**	**937-865-3986**	**937-865-4402**
OH	Ashtabula Environmental Management Project	John Ganz Joe Britcher	jganz@knownet.net joe_britcher@rmies.com	440-993-1944 440-993-1976	440-993-1961 440-993-1918
OH	Columbus Environmental Management Project	Thomas Baillieul Steve Schmucker	thomas.baillieul@ohio.doe.gov schmucks@battelle.org	614-760-7372 614-424-3314	614-718-3190 614-424-7773
OH	Fernald Environmental Management Project	Shannon Kaster Amy Siry	shannon.kaster@ohio.doe.gov amy_siry@fernald.gov	513-648-3157 513-648-3798	513-648-3077 513-648-5527
OH	Miamisburg Environmental Management Project	Rob Rothman Carol Anderson	robert.rothman@ohio.doe.gov andecr@doe-md.gov	937-865-3823 937-865-4617	937-865-4489 937-865-4380
OH	West Valley Demonstration Project	John Drake Cathy Atkinson	jdrake@wv.doe.gov atkinsc@wv.doe.gov	716-942-4993 716-942-4503	716-942-4703 716-942-2110
OR	**Oak Ridge Operations Office**	**Ana Gonzalez**	**gonzalezal@oro.doe.gov**	**865-241-4212**	**865-576-6074**
OR	East Tennessee Technology Park	Ana Gonzalez Courtney Manrod Lori Manis	gonzalezal@oro.doe.gov pce@ornl.gov lmanis@dpra.com	865-241-4212 865-576-0146 865-482-0400	865-576-6074 865-576-5971 865-482-7690
OR	Oak Ridge Institute for Science and Education	Walter L. Warnick Robert C. Morgan	walt.warnick@science.doe.gov morganc@osti.gov	301-903-6132 865-576-1188	301-903-8972 865-576-3609

POINT OF CONTACT LIST

Operations/Field Office contacts are indicated in bold. Sites that did not report in Calendar Year 1999 are indicated in italics.

Operations Office	Site/Facility Name	Contact Name	E-Mail Address	Telephone	Fax
OR	Oak Ridge National Laboratory	Ana Gonzalez Susan R. C. Michaud	gonzalezal@oro.doe.gov SUN@ornl.gov	865-241-4212 865-576-1562	865-576-6074 865-241-2843
OR	Oak Ridge Y-12 Plant	Ana Gonzalez Richard Martin Sheila Poligone	gonzalezal@oro.doe.gov martinrw@oro.doe.gov ss9@ornl.gov	865-241-4212 865-576-9428 865-241-2568	865-576-6074 865-576-0746 865-574-6934
OR	Office of Scientific and Technical Information	Ana Gonzalez Bill Edmonds	gonzalezal@oro.doe.gov Bill.Edmonds@ccmail.osti.gov	865-241-4212 865-576-3382	865-576-6074 865-576-2865
OR	Paducah Gaseous Diffusion Plant	Ana Gonzalez W. David Tidwell Brian A. Bowers	gonzalezal@oro.doe.gov tidwellwd@ornl.gov babowers@lan-fl.com	865-241-4212 270-441-6807 270-441-5057	865-576-6074 270-441-6801 270-441-5222
OR	Portsmouth Gaseous Diffusion Plant	Ana Gonzalez Dewintus Perkins Mitch Newman	gonzalezal@oro.doe.gov qpk@ornl.gov n5z@ornl.gov	865-241-4212 740-897-5524 740-897-2331/x3827	865-576-6074 740-897-3572 740-897-2900
OR	Thomas Jefferson National Accelerator Facility	Ana Gonzalez Barbara Morgan Linda Even	gonzalezal@oro.doe.gov bmorgan@jlab.org lle@jlab.org	865-241-4212 757-269-7139 757-269-7308	865-576-6074 757-269-7146 757-269-7559
OR	*Weldon Spring Site Remedial Action Project*	*Ana Gonzalez* *Tom Pauling* *Gwenan Skoba*	*gonzalezal@oro.doe.gov* *tom_pauling@wssrap-host.wssrap.com* *gwenan_attwell@wssrap-host.wssrap.com*	*865-241-4212* *314-441-8978* *314-441-8086/x3133*	*865-576-6074* *314-447-0803* *314-447-1122*
RF	**Rocky Flats Field Office**	**Dave Maxwell**	**dave.maxwell@rfets.gov**	**303-966-4017**	**303-966-4728**
RF	Rocky Flats Environmental Technology Site	Dave Maxwell Tamar Krantz	dave.maxwell@rfets.gov tamar.krantz@rfets.gov	303-966-4017 303-966-4374	303-966-4728 303-966-3578
RL	**Richland Operations Office**	**Anna Beard**	**anna_v_beard@rl.gov**	**509-376-7472**	**509-376-4963**
RL	Hanford Site	Anna Beard Pete Segall	anna_v_beard@rl.gov Peter_Segall@rl.gov	509-376-7472 509-372-0469	509-376-4963 509-373-0743
RL	Pacific Northwest National Laboratory	Anna Beard Eric Alderson	anna_v_beard@rl.gov eric.alderson@pnl.gov	509-376-7472 509-373-4233	509-372-1926 509-366-8821
SR	**Savannah River Operations Office**	**Stephen Mackmull** Tim Coffield	**stephen.mackmull@srs.gov** tim.coffield@srs.gov	**803-725-3817** 803-557-6316	**803-725-3616** 803-557-6526
SR	Savannah River Site	Sarita Berry	Sarita.Berry@srs.gov	803-557-8124	803-557-6306

Appendix D

Pollution Prevention Web Site Addresses

As recognition of the importance of pollution prevention increases, the number of pollution prevention Web sites also increases. Following is a growing list of Web site addresses for additional information on pollution prevention.

WEB SITE NAME	WEB SITE ADDRESS
Earth Day Network	**http://www.earthday.net/**
East Tennessee Technology Park, Pollution Prevention	**http://www.ornl.gov/pollution_prevention/p2main.htm**
EcoMall ("Earth's Largest Environmental Shopping Center")	**http://www.ecomall.com/**
EcoNet (environmental activists)	**http://www.igc.apc.org/econet/**
"Energy 2000" Energy Efficiency Workshop and Exposition	**http://www.energy2000.ee.doe.gov**
Environmental Compliance Assistance Center	**http://www.hazmat.frcc.cccoes.edu**
Environmental News Network	**http://www.enn.com**
Environmental RouteNet (searchable links to environmentally-related resources, selected and indexed by the editors at Cambridge Scientific Abstracts)	**http://moe.csa.com/routenet/**
Global Futures Foundation	**http://www.globalff.org/**
Global Network of Environment and Technology	**http://gnet.together.org/**
Idaho National Engineering and Environmental Laboratory	**http://www.inel.gov/**
International Council for Local Environmental Initiatives	**http://www.iclei.org./**
Javits-Wagner-O'Day (JWOD, supplier of environmentally-friendly products)	**http://www.jwod.com/**
Joint Service Pollution Prevention Technical Library	**http://enviro.nfesc.navy.mil/p2library**
Lawrence Berkeley National Laboratory, "Cutting Paper" Reduction Information	**http://eetd.lbl.gov/paper**
Lawrence Berkeley National Laboratory, Waste Minimization	**http://www.lbl.gov/ehs/wastemin/**
Lawrence Livermore National Laboratory	**http://www.llnl.gov/**
Los Alamos National Laboratory, Environmental Stewardship Office	**http://emeso.lanl.gov/**
National Nuclear Security Administration	**http://www.nnsa.doe.gov/**
National Pollution Prevention Center for Higher Education, Center for Sustainable Systems	**http://www.snre.umich.edu/nppc/**
National Pollution Prevention Roundtable	**http://www.p2.org/**
Office of the Federal Environmental Executive	**http://www.ofee.gov/**

WEB SITE NAME	WEB SITE ADDRESS
Pacific Northwest National Laboratory, "Picture This" Photographic Resource	**http://picturethis.pnl.gov./**
Pacific Northwest National Laboratory, Pollution Prevention Program	**http://p2.pnl.gov:2080/p2/**
Pollution Prevention Conference 1999	**http://p2.sandia.gov/**
SAGE Solvent Alternatives Guide	**http://clean.rti.org/**
State of Maine Department of Environmental Protection	**http://janus.state.me.us/dep/home.htm**
State of Michigan Department of Environmental Quality	**http://www.deq.state.mi.us**
State of Pennsylvania, Department of Environmental Protection	**http://www.dep.state.pa.us/**
U.S. Army, Environmental Center	**http://aec.army.mil/**
U.S. Army, Medical Research and Materiel Command	**http://mrmc-www.army.mil/**
U.S. Bureau of the Census, Center for Economic Studies	**http://www.census.gov/cecon/www/ces.html**
U.S. Department of Commerce, Fedworld	**http://www.fedworld.gov**
U.S. Department of Energy	**http://www.doe.gov**
U.S. Department of Energy, Albuquerque Operations Office, Pollution Prevention Center of Excellence	**http://www.doeal.gov/oepm/p2home.htm**
U.S. Department of Energy, Environment, Safety and Health Information Portal	**http://www.tis.eh.doe.gov/portal/**
U.S. Department of Energy, National Environmental Training Office	**http://www.em.doe.gov/neto/**
U.S. Department of Energy, Oak Ridge Operations, National Center of Excellence for Metals Recycle	**http://www.oakridge.doe.gov/astutl/metals/**
U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Office of Industrial Technologies, Chemical Industry Team	**http://www.oit.doe.gov/IOF/chemicals/**
U.S. Department of Energy, Office of Environmental Management	**http://www.em.doe.gov**
U.S. Department of Energy, Office of Environmental Management, Office of Disposition and Integration, Pollution Prevention Team (EM-22)	**http://www.em.doe.gov/wastemin (select Pollution Prevention Team) http://twilight.saic.com/wastemin/**
U.S. Department of Energy, Office of Environmental Management, Office of Disposition and Integration, Pollution Prevention Team (EM-22), "Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition"	**http://twilight.saic.com/ap**

WEB SITE NAME	WEB SITE ADDRESS
U.S. Department of Energy, Office of Environmental Management, PEIS Lawsuit Settlement Agreement Database	**http://www.em.doe.gov/settlement/**
U.S. Department of Energy, Office of Environmental Management, Pollution Prevention in the Environmental Restoration Program	**http://www.em.doe.gov/p2/**
U.S. Department of Energy, Office of Environmental Management, Program Integration	**http://www.em.doe.gov/progint/**
U.S. Department of Energy, Office of Environmental Policy and Assistance (EH-41), Toxic Release Inventory (TRI) Reports	**http://tis-nt.eh.doe.gov/oepa/facility/tri/tri_rpt.htm**
U.S. Department of Energy, Office of Environmental Policy and Assistance (EH-41)	**http://tis-nt.eh.doe.gov/oepa/**
U.S. Department of Energy, Office of the Deputy Administrator for Defense Programs	**http://www.dp.doe.gov/dp45/p2**
U.S. Department of Energy, Pollution Prevention Information Clearinghouse (EPIC)	**http://epic.er.doe.gov/epic/**
U.S. Environmental Protection Agency	**http://www.epa.gov**
U.S. Environmental Protection Agency, Enviroene	**http://es.epa.gov/**
U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics	**http://www.epa.gov/opptintr/p2home**
Waste Management Conference 2001	**http://www.wmsym.org/**
White House (Executive Orders)	**http://www2.whitehouse.gov/**

Appendix E

Glossary of Terms

11e(2) BYPRODUCT MATERIAL - As defined by Section 11e(2) of the Atomic Energy Act of 1954, as amended, and Department of Energy Order 5820.2A, 11e(2) byproduct material is "the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." Ore bodies depleted by uranium solution extraction operations and which remain underground do not constitute byproduct material.

AFFIRMATIVE PROCUREMENT - The Resource Conservation and Recovery Act, Section 6002, requires federal agencies to purchase items designated by the Environmental Protection Agency (EPA) as having recycled or recovered content. President Clinton's Executive Order 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, requires all federal agencies to increase their effort in waste prevention, recycling, and the purchase of environmentally preferable products. Executive Order 13101 supersedes Executive Order 12873, *Federal Acquisition, Recycling and Waste Prevention*, and requires federal agencies to set goals for solid waste prevention and recycling for the years 2000, 2005, and 2010. Federal agencies should also incorporate the recycle/reuse of pallets and the collection of toner cartridges for remanufacturing into their recycling programs, set goals to increase the procurement of products made with recovered materials, and increase the use of environmentally preferable products and services. In May 1996, the Secretary of Energy set a goal increasing the Department of Energy's procurement of EPA-designated items to 100 percent by December 31, 1999.

CALENDAR YEAR - The twelve-month period based on the Gregorian calendar, beginning January 1 and ending December 31.

CLASS I OZONE-DEPLETING SUBSTANCES - Chlorofluorocarbons, halons, carbon tetrachloride, and methylchloroform which cause or contribute significantly to harmful effects on the stratospheric ozone layer.

CLEANUP/STABILIZATION WASTE - Cleanup/stabilization encompasses a complex range of activities including environmental restoration of contaminated media (soil, groundwater, surface water, sediments, etc.); stabilization of nuclear and nonnuclear (chemical) materials; and deactivation and decommissioning (including decontamination) of facilities. Cleanup/stabilization waste consists of one-time operations waste produced by environmental restoration program activities, including primary and secondary wastes associated with retrieval and remediation operations; "legacy wastes;" and wastes from decontamination and decommissioning/transition operations. It also includes all Toxic Substances Control Act regulated wastes, such as polychlorinated biphenyl-contaminated fluids and/or equipment. Note that cleanup/stabilization activities that generate wastes do not necessarily occur at a single point in time, but may have a duration of several years during which time wastes are produced.

By definition, these activities are not considered to be routine (periodic and/or on-going), because *the waste is a direct result of past operations and activities*, rather than a current process. Newly generated wastes that are produced during these "one-time operations" are considered to be a secondary wastestream, and are separately accounted for whenever possible. This secondary (newly generated) waste usually results from common activities such as handling, sampling, treatment, repackaging, shipping, etc.

Example: Twenty drums of unknown waste are retrieved from an old dump site. The waste must be sampled and characterized before any treatment or disposal options can be determined. What kinds of waste are generated by this particular activity?

Primary Waste: the original 20 drums of waste (including the drums) which were retrieved. The 20 drums of waste were generated by past operations, and are not considered newly generated wastes.

Secondary Waste: any newly generated waste which results from the retrieval, sampling, or characterization process (e.g., anti-contamination clothing, sample vials, syringes, chemicals, containers, contamination control structures, etc.).

DEACTIVATION AND DECOMMISSIONING (D&D) - Actions taken to reduce the potential health and safety impacts of contaminated DOE facilities, including activities to remove a facility from operation, followed by decontamination, entombment, dismantlement, or conversion to another use.

DOE AREA OFFICES - The first line DOE field element that carries the organizational responsibility for (1) managing and executing assigned programs, (2) directing contractors who conduct programs, and (3) assuring that environment, safety, and health protection are integral parts of each program.

DOE FIELD OFFICES - The first line DOE field element that carries the organizational responsibility for (1) managing and executing assigned programs, (2) directing contractors who conduct programs, and (3) assuring that environment, safety, and health protection are integral parts of each program.

DOE OPERATIONS OFFICES - In the absence of a DOE Area Office, the first line DOE field element that carries the organizational responsibility for (1) managing and executing assigned programs, (2) directing contractors who conduct programs, and (3) assuring that environment, safety, and health protection are integral parts of each program.

FISCAL YEAR - For DOE, the twelve-month period used for accounting purposes, beginning October 1 and ending September 30.

HAZARDOUS WASTE - A solid waste, or combination of wastes, that because of its quantity, concentration, or physical, chemical, or infectious characteristics, may (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness, or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored,

transported, or disposed of, or otherwise managed. Hazardous waste is further defined in this report as:

Resource Conservation and Recovery Act (RCRA) regulated - solid waste, not specifically excluded from regulation under 40 CFR 261.4, or delisted by petition, that is either a listed hazardous waste (40 CFR 261.30 - 261.33) or exhibits the characteristics of a hazardous waste (40 CFR 261.20 - 261.24).

State regulated - any other waste not specifically regulated under RCRA, which may be regulated by State or local authorities, such as used oil.

Toxic Substances Control Act (TSCA) regulated - Individual chemical wastes (both liquid and solid), such as polychlorinated biphenyls, which are regulated by the Toxic Substances Control Act.

HIGH-LEVEL RADIOACTIVE WASTE - The highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

LIFE-CYCLE ASSET MANAGEMENT - A DOE policy required by DOE Order 430.1 for the treatment of Departmental land and facilities as valuable national resources; and the planning, acquisition, operation, maintenance, and disposal of land and facilities in a cost-effective manner.

LOW-LEVEL MIXED WASTE - Waste that contains both radioactive and hazardous components, as defined by the Atomic Energy Act, Toxic Substances Control Act, or Resource Conservation and Recovery Act. Mixed waste is further defined in this Report as low-level mixed and Toxic Substances Control Act mixed.

LOW-LEVEL RADIOACTIVE WASTE - Radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste byproduct material (as defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material.

POLLUTION PREVENTION - Preventing or reducing the generation of pollutants, contaminants, hazardous substances, or wastes at the source, or reducing the amount for treatment, storage, and disposal through recycling.

Waste minimization/pollution prevention can be applied to all pollution-generating activities at DOE, including:

- Manufacturing and production operations
- Weapons dismantlement
- Maintenance
- General operations
- Transportation
- Research, development, and demonstration

- Laboratory research
- Decommissioning activities
- Legacy waste and contaminated site cleanup

Waste minimization/pollution prevention can be achieved through:

- **Source Reduction** - equipment or technology selection or modification, process, or procedure modification; reformulation or redesign of products; substitution of raw materials; and improvements in housekeeping, maintenance, training, or inventory control. Increased efficiency in the use of raw materials, energy, water, or other resources, including affirmative procurement. Protection of natural resources by conservation.
- **Segregation** - the practice of separating or isolating contaminated materials from non-contaminated materials; or the separation/isolation of one waste type from another in an attempt to minimize the amount of the more noxious (and costly) material for disposal.
- **Recycle/Reuse** - the use, reuse, or reclamation of waste materials.

Environmental restoration activities are directed toward removal and treatment of legacy waste and pollutants already generated by past production and manufacturing operations. In the process of conducting restoration activities, additional waste and pollutants may be generated (e.g., decommissioning of a plant and equipment; dismantlement of weapons systems). Waste minimization/pollution prevention techniques should be employed during these activities to prevent or reduce the generation of new wastes and pollutants.

POLLUTION PREVENTION OPPORTUNITY ASSESSMENT (PPOA) - Appraisal of a process, activity, or operation as a way of identifying and evaluating potential waste minimization opportunities.

PRIMARY WASTE - See Cleanup/Stabilization Waste definition.

PROGRAMMATIC ACTIVITIES - Designation used for reporting pollution prevention activities that do not result in directly quantifiable waste reductions and cost savings. Examples of these activities include training, outreach, public awareness, research and development, conduct of pollution prevention opportunity assessments, infrastructure development, and recognition awards. This designation is also used to capture any activity that provides a cost savings with no measurable waste reduction.

PROGRAM SECRETARIAL OFFICE (PSO) - An office within DOE, headed by an Assistant Secretary or Organizational Director, that reports and has management responsibility over designated multi-program Operations Offices and National Laboratories. These offices include Defense Programs (DP), Energy Efficiency and Renewable Energy (EE), Environmental Management (EM), Office of Fossil Energy (FE), Human Resources and Administration (HR), Nuclear Energy (NE), Office of Civilian Radioactive Waste Management (RW), and Office of Science (SC).

RCRA REGULATED WASTE - See Hazardous Waste definition.

RECYCLING/REUSE - See Pollution Prevention definition.

REPORTING SITE - A specific DOE site that reported data for the *Annual Report of Waste Generation and Pollution Prevention Progress*.

ROUTINE OPERATIONS WASTE - Normal operations waste produced by any type of production, analytical, and/or research and development laboratory operations; treatment, storage, or disposal operations; "work-for-others;" or any other periodic and recurring work that is considered ongoing. The term "normal operations" refers to the type of ongoing process (e.g., production) *not* to the specific activity that produced the waste. Periodic laboratory or facility clean-outs and spill cleanups which occur as a result of these processes are also considered normal operations.

SANITARY WASTE - Wastes, such as garbage, that are generated by normal housekeeping activities, and are not hazardous or radioactive. All waste that is municipal in nature, non-hazardous, and is disposed in a landfill (basically RCRA Subtitle D waste), such as non-hazardous industrial waste, food waste, sludges, construction and building demolition debris, concrete, and asphalt.

SECONDARY WASTE - See Cleanup/Stabilization Waste definition.

SEGREGATION - See Pollution Prevention definition.

SITE - A geographic entity comprising land, installations, and/or facilities required to perform program objectives for which DOE has (or shares) responsibility for environmental restoration or waste management activities. A site generally has all of the required management functions within its organizational structure. Examples of sites include the Hanford Site, Savannah River Site, Brookhaven National Laboratory, Kansas City Plant, Pantex Plant, and the Oak Ridge Y-12 Plant.

SITE-WIDE POLLUTION PREVENTION PROGRAM ACCOMPLISHMENTS - Waste minimization accomplishments that affect the entire site, rather than just a single process or PSO-specific activity. Site-wide accomplishments include efforts directed at all employees at the reporting site, such as a narrative description of recycling programs (paper, aluminum cans, etc.).

SOURCE REDUCTION - See Pollution Prevention definition.

STORAGE - Holding radioactive, hazardous, or sanitary waste for a temporary period, at the end of which the waste is treated, disposed, or stored elsewhere.

TRANSURANIC WASTE - Waste that is contaminated with alpha-emitting radionuclides with an atomic number greater than 92 (heavier than uranium), half-lives greater than 20 years, and concentrations greater than 100 nanocuries per gram of waste.

TREATMENT - Any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any radioactive, hazardous, or sanitary waste, so as to neutralize, recover energy or material resources from the waste; to render the waste nonhazardous, safer to transport, store, or dispose; to render the waste amenable for recovery or storage; or to reduce its volume.

VOLUME REDUCTION - A waste management practice applied to waste, after it has been generated, to reduce the amount for disposal by physically minimizing the void space in the waste matrix (i.e., increasing unit density). Although volume reduction reduces the unit volume to be disposed, it is not considered a pollution prevention practice because it does not affect the amount of waste that is actually generated. Examples of volume reduction techniques include compaction, supercompaction, shredding, and incineration for solid wastes; and ion exchange, filtration, ultrafiltration, reverse osmosis, and evaporation for liquid wastes.

WASTE GENERATION - Any waste produced during the current calendar year. Does not include waste produced in previous years that is being re-packaged, treated, or disposed in the current calendar year. Does include secondary waste generated by the treatment, storage, or disposal of previously generated wastes (e.g., clothing, gloves, waste from maintenance operations, etc.).

WASTE MINIMIZATION - An action that economically reduces the amount or toxicity of waste either through physical means or through administrative controls. If the reduction occurs at the point of origin (i.e., reduces the amount of waste generated) the activity is considered pollution prevention; if the reduction occurs after generation and prior to disposal, the activity is considered a standard waste management practice. The minimization of secondary wastes is, however, considered pollution prevention.

WASTESTREAM - A waste or group of wastes with similar physical form, radiological properties, Environmental Protection Agency waste codes, or associated Land Disposal Restriction treatment standards. The waste or group of wastes may be the result of one or more processes or operations.

WASTE TYPE - Definition of waste based on physical properties or characteristics (e.g., high-level, transuranic, low-level radioactive, low-level mixed, hazardous, or sanitary).

WASTEWATER - Used process and nonprocess water that may require treatment before being returned to the environment. Examples of process wastewater include cooling water, boiler or cooling tower blowdown, and ion-exchange regeneration wastewater. Examples of nonprocess wastewater include gray water, lavatory discharges, storm water, well purge water; water from irrigation drainage, lawn watering, or vehicle washing; etc. Wastewater also includes liquid discharges to publicly owned treatment plants which are governed by the Environmental Protection Agency (EPA) or state issued National Pollutant Discharge Elimination System permits, or local pretreatment standards. [Note: wastewater generation amounts are not collected or reported in this Report. However, liquid radioactive wastes that are treated and stored onsite are accounted for in the data presented in this Report.]

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